EPA

United States Environmental Protection Agency
Washington, DC 20460

Work Assignment

Work Assignment Number: 3-02

☐ Other ☐ Amendment Number:

Contract Number	Contract Period	Title of Work Assignment/SF Site Name
EP-C-13-039	09/11/2013 To 07/31/2017	SW & GI Analytical Support
	Base Option Period Number 3	

Contractor: ABT ASSOCIATES INC.

Specify Section and paragraph of Contract SOW:

Purpose:
- [X] Work Assignment
- [ ] Work Assignment Amendment
- [ ] Work Plan Approval
- [ ] Work Assignment Close-Out
- [ ] Incremental Funding

Period of Performance: From 09/08/2016 To 07/31/2017

Comments:

☐ Superfund — Accounting and Appropriations Data — [X] Non-Superfund

SFO (*Max 2*): ☐

Note: To report additional accounting and appropriations date use EPA Form 1900-69A.

Line	DCN (Max 6)	Budget/FY (Max 4)	Appropriation Code (Max 6)	Budget Org/Code (Max 7)	Program Element (Max 9)	Object Class (Max 4)	Amount (Dollars)	(Cents)	Site/Project (Max 8)	Cost Org/Code
1										
2										
3										
4										
5										

Authorized Work Assignment Ceiling

	Cost/Fee	LOE
Contract Period: 09/11/2013 To 07/31/2017		0
This Action:		345
Total:		345

Work Plan / Cost Estimate Approvals

	Cost/Fee	LOE
Contractor WP Dated:		
Cumulative Approved:		

Work Assignment Manager Name: Todd Doley (Signature) (Date)	Branch/Mail Code: Phone Number: 202-566-1160 FAX Number:
Project Officer Name: Ahmar Siddiqui (Signature) (Date)	Branch/Mail Code: Phone Number: 202-566-1044 FAX Number:
Other Agency Official Name: (Signature) (Date)	Branch/Mail Code: Phone Number: FAX Number:
Contracting Official Name: Tammy Adams TAMMY ADAMS Digitally signed by TAMMY ADAMS DN: c=US, o=U.S. Government, ou=USEPA, ou=Staff, cn=TAMMY ADAMS, dnQualifier=0000018417 Date: 2016.09.08 13:05:52 -04'00' (Signature) (Date)	Branch/Mail Code: Phone Number: 513-487-2030 FAX Number: 513-487-2545

WORK ASSIGNMENT

I. Title: Stormwater Economic Analysis Support

Contractor: Abt Associates **Contract No.:** EP-C-13-039

II. Work Assignment Number: 3-02

III. Estimated Period of Performance: Date of Issuance to July 31, 2017

IV. Estimated Level of Effort: 345 hours

V. Key EPA Personnel:

Work Assignment Contracting Officer's Representative (WACOR):

Todd Doley
OST/EAD (4303T)
202/566-1160
202/566-1053 (fax)

VI. Background and Purpose:

Under Executive Orders 12866 and 13563, the Environmental Protection Agency (EPA) is required to estimate the potential benefits and costs to society resulting from its regulations. Although EPA does not anticipate issuing a stormwater regulation at this time, nonetheless any future regulation would require estimation of costs and benefits. As such, the purpose of this Work Assignment (WA) is to estimate the total social costs and economic benefits to society from possibly regulating the construction and development industry and expanding Municipal Separate Storm Sewer System (MS4) coverage.

Total social costs are the sum of private (compliance) and external costs. Economic benefits are estimated by characterizing, quantifying and to the extent possible, monetizing the value to society from regulating the construction and development industry. In addition to total social costs, this WA is meant to assess possible financial impacts as a result of possible regulations. Costs and their burden include, but are not limited to: 1) the compliance costs borne by the construction and development industry sector and MS4s, 2) potential external costs and secondary and unforeseen consequences of a rule, 3) the burden/incidence of costs passed to the consumer; and 4) the uncertainty distribution of various costs associated with a rule.

Under this work assignment the contractor shall conduct all analyses requiring the collection and manipulation of data and models in accordance with the EPA approved quality assurance project plan (QAPP) that will be based on an approved QAPP that will be developed under Task 2 of this work assignment. The QAPP shall describe the procedures for assuring the quality of the primary and secondary economic data used for this work assignment.

In carrying out the tasks specified in this work assignment, the contractor will be called upon to build on and continue work performed under previous work assignments 0-02, 1-02, and 2-02. The work performed under this work assignment will not duplicate work conducted under the previous work assignments.

VII. General Requirements of the Work Assignment and Schedule

Confidential Business Information: During the course of the work assignment, the contractor will be accessing and evaluating CBI. As such, the contractor shall adhere to EPA's CBI policy and other procedures as described in the contract clauses (Clauses H.15-H.19 and H.21). The contractor must

maintain CBI security clearance to use CBI information. The contractor will not disclose any CBI to anyone other than EPA without prior written approval from the EPA WACOR. The contractor shall, at all times, adhere to Confidential Business Information (CBI) procedures when handling industry information. The contractor shall manage all reports, documents, and other materials and all draft documents developed under this work assignment in accordance with the procedures set forth in our "Office of Science and Technology Confidential Business Information Application Security Plan" (August 2011) or its successor approved plans.

Budget Reporting: The contractor under this work assignment is required to report to the EPA WACOR when 75 percent of the total work assignment funding amount has been depleted. The contractor must also report to the EPA WACOR when 75 percent of the approved Work plan budget has been depleted.

Identification as Contracting Staff: To avoid the perception that contractor personnel are EPA employees, contractor personnel shall be clearly identified as independent contractors of EPA when participating in events with outside parties and prior to the start of any meeting. Contractor personnel are prohibited from acting as the Agency's official representative. When speaking with the public, the contractor shall refer all interpretations of policy to the EPA WACOR.

Limitation of Contractor Activities: The contractor shall submit drafts of all deliverables to the EPA WACOR for review prior to submission of the final product. These drafts will clearly specify the methods, procedures, considerations, assumptions, relevant citations, data sources and data that support any conclusions and recommendations. The contractor shall incorporate all EPA WACOR comments into all final deliverables, unless otherwise agreed upon by the EPA WACOR. The contractor shall adhere to all applicable EPA management control procedures as implemented by the EPA Contracting Officer (CO), EPA Contract-Level Contracting Officer's Representative (CL-COR), and EPA WACOR.

Quick Response: Under this Performance Work Statement the contractor may be required to provide information for use by EPA for quick responses and analyses of options, issues, and policy decisions. Quick responses are those which require completion in one to five working days.

Travel: The contractor shall not be required to travel under this work assignment.

Deliverable Formatting: All memos, draft comments, summaries and responses, and chapters are to be provided in hard copy and in electronic form using Word and/or Excel/Access, ArcView, or, in special cases another software program agreed to by EPA. Memos are to be written in a manner which will make them easy to turn into draft chapters for the Final Report. For deliverables that are in Word or pdf versions of Word documents, that are intended to be shared with management or the public, the contractor shall use decimal align in all tables containing columns of numbers of varying digits, whether decimal places are reported or not. All final materials, e.g., memos, chapters, etc. are to be prepared only after receiving written technical direction from the EPA WACOR.

VIII. Performance Work Statement

Task 1 - Prepare Work Plan

The contractor shall prepare a work plan within 15 calendar days of receipt of the work assignment. The work plan shall outline, describe and include the technical approach, resources, timeline and due dates for deliverables, a detailed cost estimate by task, and a staffing plan. The EPA WACOR, the CL-COR and the CO will review the work plan. However, only the CO can approve/disapprove, suggest revisions, or change the work plan. Official revisions will be given to the contractor by the CO. The contractor shall prepare a

revised work plan incorporating the CO's comments, if required.

A weekly update call with the EPA WACOR will be required for this work assignment to discuss progress on deliverables and other potential issues.

Deliverables and schedule under Task 1

1a. Work plan within 15 calendar days of receipt of work assignment.
1b. Weekly Update Call

Task 2 - Quality Assurance

2.1 Background

QAPPs are required under the Agency's Quality Assurance Policy CIO-2105, formerly EPA Order 5360.1A2 and implementing guidance CIO-2105-P-01-0. All projects that involve the generation, collection, analysis and use of environmental data must have an approved QAPP in place prior to the commencement of the work. Examples of these environmental data operations are provided in Table 2.1 below.

Table 2.1. Examples of work that involves the collection, generation, evaluation, analysis, or use of environmental data

Item	Examples
Data	Includes field sampling information (sample location information, flow measurements, temperature, pH, physical observations, etc.), laboratory measurements (e.g., chemical, physical, biological, radiological measurements), data collected from questionnaires, economic data, census data, and any other types of existing data (i.e., data generated for a different purpose or generated by a different organization)
Data generation	Includes field studies, laboratory studies, and generation of modeling output
Data collection	Includes field surveys, questionnaire surveys, literature searches, and third party data
Data evaluation	Includes data inspection, review, assessment, and validation
Data analysis	Includes statistical, engineering, and economic analysis, and testing, evaluation, and validation of methods and models; database creation, data extraction, and data manipulation
Data Use	Any use of data to support EPA decisions, regulations, policy, publications, or tools (including effluent guidelines, 304(m) program, standards, environmental assessments, and models, tools, or reports disseminated by EPA to assist other organizations in implementing environmental programs)

Note that QAPPs are required for the development or revision of models and software that support the generation, collection, evaluation, analysis, or use of data. (A model is set of equations and assumptions used to predict unknown data.) When existing models are used as a tool to generate or evaluate data, the project QAPP must describe the model and explain how it will be used and how its output will be evaluated to ensure the modeling effort meets the overall quality objectives for the project. Development or revision of new models also must be supported by a QAPP that describes the objectives for the model, the quality criteria that will be applied to the model, and the procedures for evaluating whether the model meets those criteria.

2.2 QA Project Plan Requirements

The Contractor has previously prepared a contract-wide Programmatic QAPP (PQAPP) for Contract EP-C-13-039. This PQAPP describes, in a single document, information that is not site or time-specific, but applies throughout the program (i.e., the duration of the contract). When tasked with preparing the PQAPP, the Contractor was informed that the PQAPP may need to be supplemented with project-specific details to support individual work assignments that involve the collection, generation, evaluation, analysis, or use of environmental data.

The activities in this work assignment involve gathering, evaluating, analyzing, and otherwise using existing environmental data (also known as "secondary" use of data). However, EPA has determined that the Contractor is operating under the existing PQAPP and that the PQAPP addresses QA requirements for this work assignment. In support of this work assignment, the Contractor shall ensure that the work plan provides enough detail to clearly describe:

- Specific objectives of the project(s) supported by this work assignment.
- The type of data to be gathered or used under this work assignment to support the project objectives—including data from search engines, federal databases, EPA data bases, letters from industry—as a well as a rationale for when those sources are appropriate and what data available in each will support the project
- The quality objectives needed to ensure the data will support the project objectives, and
- The quality assurance/quality control (QA/QC) activities to be performed to ensure that any results obtained are documented and are of the type, quality, transparency, and reproducibility needed.

Table 1 at the end of this WA demonstrates how the PQAPP addresses QA requirements for this work assignment. The contractor shall fill in staff roles to the Table 1 checklist under A.4 and make any additional detailed notes in the 'explanatory comments' column as requested by the WACOR.

2.3 Additional QA Documentation Required

The EPA Quality Manual for Environmental Programs (CIO 2105-P-01-0, May 2000) requires published Agency reports containing environmental data to be accompanied by a readily identifiable section or appendix that discusses the quality of the data and any limitations on the use of the data with respect to their originally intended application. The EPA Quality Manual further requires Agency reports to be reviewed by the QA manager (or other authorized official) before publication to ensure that an adequate discussion of QA and QC activities is included. The purpose of the review is to ensure the reports provide enough information to enable a knowledgeable reader to determine if the technical and quality goals were met for the intended use of the data. Reports should include applicable statements regarding the use of any environmental data presented as a caution about possible misuse of the data for other purposes.
For example, a Technical Support Document or Study Report must include a clear discussion of the quality management strategies (including the project goals and objectives, quality objectives and criteria, and QA/QC practices) that were employed to control and document the quality of data generated and used. These documents should also discuss any deviations from procedures documented in the EPA-approved QAPP(s) supporting the project, the reasons for those deviations, any impact of those deviations had on data quality, and steps taken to mitigate data quality issues.

In support of this Agency requirement, all major deliverables (e.g., Technical Support Documents, Study Reports, Analytical Methods) produced by the Contractor under this work assignment must include a discussion of the QA/QC activities that were performed to support the deliverable, and this discussion must provide a sufficient level of detail to allow the Sustainable Technology Division (STD) QA Coordinator (or designee) to determine if the QA/QC strategies implemented for the project sufficiently support the intended

use of the data. Upon receipt, the EPA WACOR will review each applicable report and certify whether the Contractor has adhered to the QA requirements documented in the Contractor's PQAPP.

The Contractor also shall provide EPA with monthly reports of QA activities performed during implementation of this work assignment. These monthly QA reports shall identify QA activities performed to support implementation of this work assignment, problems encountered, deviations from the QAPP, and corrective actions taken. If desired, the Contractor may include this as a part of the contract-required monthly financial/technical progress report. If the contractor's monthly reports identify potential additional QA requirements, they should be discussed with the WACOR.

2.4 Data Quality Act/Information Quality Guidelines Requirements

The Data Quality Act (also known as the Information Quality Act) requires EPA to ensure that influential information disseminated by the Agency is sufficiently transparent in terms of data and methods of analysis that the information is capable of being substantially reproduced. To support compliance with these data transparency/ data reproducibility requirements, EPA plans to include QAPPs as part of any rulemaking record documentation to be made available to the public. (This includes PQAPPs and Supplemental QAPPs (SQAPPs)). The Contractor may claim information in QAPPs as confidential; if the Contractor chooses to do so, the Contractor shall submit a sanitized (i.e., public) version and an unsanitized (i.e., confidential) version at the time the QAPP is submitted for approval by EPA. The sanitized version shall be included in the public docket for the applicable rulemaking (or other docket record), and the unsanitized version shall be included in a non-public (i.e., confidential) portion of the docket (or record).

Information contained in the approved QAPP shall be transparent and reproducible and meet the requirements of the Data Quality Act for influential information. EPA's *Guidelines for Ensuring and Maximizing the Quality, Objectivity, Utility, and Integrity, of Information Disseminated by the Environmental Protection Agency* (EPA/260R-02-008, October 2002), referred to as "EPA's Information Quality Guidelines," describe EPA procedures for meeting Data Quality Act requirements. Section 6.3 of EPA's Information Quality Guidelines indicate that "especially rigorous robustness checks" should be applied in circumstances where quality-related information cannot be disclosed due to confidentiality issues. Where applicable, the Contractor should indicate which results were obtained using the tools (standard operating procedures (SOPs), checklists, and guidelines) that the Contractor designates as confidential so that the EPA WACOR can easily identify the areas that shall require rigorous robustness checks and document that those checks have been performed. At the discretion of the EPA WACOR, the contractors may be requested to prepare pre-dissemination review checklist as described in Appendix B of the Office of Water Quality Management Plan, April, 2015. If this is required, the EPA WACOR will notify the Contractor through written technical direction.

Deliverables and schedule under Task 2

2. Monthly reports of QA work performed (may be included in the Contractor's monthly progress report).

Task 3 - Adherence to the Standardized Naming Convention and Version Control

The contractor shall continue to follow the standardized naming convention and version control (SNCVC) for all deliverables associated with the WA. This SNCVC was established under the previous WA in a signed memorandum. This system ensures that deliverables are clearly named and dated and that the sequence of versions of a document is clear.

No deliverables under Task 3

Task 4 – Cost Savings Case Study

Under work assignment 2-02, the contractor began work on a case study of the potential cost savings for states and localities to increase the set of acceptable control practices that can be used to meet existing state stormwater requirements to include stormwater retention practices. The contractor shall develop a report (15-25 pages) that summarizes the data sources and methods used, presents results in a series of tables and graphs, and provides conclusions on how the results could be relevant to state and local officials in charge of stormwater management.

Deliverables and schedule under Task 4.

4.a Draft Stormwater Control Cost-savings Report by October 4, 2016
4.b If additional edits are required the document must be updated within 21 calendar days of receipt of comments from the EPA WACOR, at technical direction of EPA WACOR.

Task 5 – Project Prediction Model Report

The contractor shall develop a summary version (20-30 pages) of the project prediction model document delivered under WA 0-02. The report should focus on the objectives for developing the model, the basic structure of the model, and model outputs that have relevance to stormwater management at the national, state, and metropolitan area level.

Deliverables and schedule under Task 5.

5.a Draft Project Prediction Model Report by October 14, 2016
5.b If additional edits are required the document must be updated within 21 calendar days of receipt of comments from the EPA WACOR, at technical direction of EPA WACOR.

Task 6 – Support for Office of Water Stormwater Outreach Efforts

EPA anticipates the need to provide additional materials to Office of Water (OW) staff that will be used to prepare outreach materials for the public. The EPA WACOR will need contractual support identifying and preparing these materials for OW staff. In response to technical direction from the EPA WACOR, the contractor shall identify, locate, prepare, and deliver materials relevant to the analyses performed for the Stormwater Rule. All of these materials, which may include spreadsheets, memorandums, and reports, will be existing files and will not require the generation of new files. For planning purposes the contractor assume 6-12 requests for material during this work assignment.

Deliverables and schedule under Task 6.

6. Materials related to analytical work performed for the Stormwater Rule Analysis, contingent upon receiving technical direction from the EPA WACOR.

Appendix

EAD Checklist for WA 3-02 Stormwater Economic Analysis Support, Contract EP-C-13-039, Utilizing Existing Data

The items noted in this checklist are adapted from those elements found in *EPA Requirements for QA Project Plans (QA/R-5)* (EPA, 2001a), but tailored to the use of existing data.

Table 1. EAD Checklist for WA 3-02 Utilizing Existing Data

QAPP Element	A = Applicable N/A = Not applicable		Covered in PQAPP?	Covered in SQAPP?	Ac = Acceptable NAc = Not Acceptable		Comments
	A	N/A			Ac	NAc	
A1. Title & Approval Sheet							
Project title	X		X				PQAPP Page ii
Organization's name	X		X				PQAPP Page ii
Effective date and/or version identifier	X		X				PQAPP Page ii
Dated signature of Organization's project manager	X		X				PQAPP Page ii
Dated signature of Organization's QA manager	X		X				PQAPP Page ii
Other signatures, as needed (e.g., EAD Project Officer, EAD QA Coordinator)	X		X				PQAPP Page ii
Revision History	X		X				PQAPP Page ii
A2. Table of Contents							
Includes sections, figures, tables, references, and appendices	X		X				PQAPP Page iv
Document control information indicated (when required by the EPA Project Manager and QA Manager)		X					PQAPP Page iv
A3. Distribution List							
Includes all individuals who are to implement or otherwise receive the QAPP and identifies their organization	X		X				PQAPP Page iii

QAPP Element	A = Applicable N/A = Not applicable		Covered in PQAPP?	Covered in SQAPP?	Ac = Acceptable NAc = Not Acceptable		Comments
	A	N/A			Ac	NAc	
A4. Project/Task Organization							
Identifies key individuals with their responsibilities (e.g., data users, decision makers, project QA manager, Subcontractors, etc.) and contact info.	X		X				PQA _____ Completed Checklist attached to work plan.
Organization chart shows lines of authority & reporting responsibilities	X		X				PQAPP Section 2.1
Project QA manager position indicates independence from unit collecting/using data	X		X				PQAPP Section 2.1
A5. Problem Definition/Background							
Clearly states problem to be resolved, decision to be made, or hypothesis to be tested	X		X				PQAPP Section 2.2
Identifies project objectives or goals	X		X				Reference PQAPP Table 2.2; also address in Work Plan if needed.
Historical & background information		X					
Cites applicable technical, regulatory, or program-specific quality standards, criteria, or objectives	X		X				PQAPP Section 2.2
A6. Project/Task Description							
List measurements to be made/data to obtain	X		X				PQAPP section 2.3
Notes special personnel or equipment requirements		X					
Provides work schedule		X					Will be addressed in workplan
A7. Overall Quality Objectives & Criteria							
States overall quality objectives and limits needed to support the project goals and objectives cited in Element A5.	X		X				PQAPP section 2. 4
A8. Special Training Requirements/ Certifications							
Identifies specialized skills, training or certification requirements	X		X				PQAPP section 2.5
Discusses how this training will be provided/the necessary skills will be assured and documented	X		X				PQAPP section 2.5
A9. Project-level Documents & Records							

QAPP Element	A = Applicable N/A = Not applicable		Covered in PQAPP?	Covered in SQAPP?	Ac = Acceptable NAc = Not Acceptable		Comments
	A	N/A			Ac	NAc	
Describes process for distributing the approved QAPP and other planning documents (and updates) to staff	X		X				PQAPP Section 2.6
Identifies final work products that will result from the project	X		X				Will be addressed in workplan
Describes the process for developing, reviewing, approving, and disseminating the final work products and individuals responsible for these processes	X		X				Will be addressed in workplan
B1. Data Needs							
Detailed list/description of the specific data elements needed to support project goals	X		X				Data used for the WA documented in PQAPP Section 3.1.
Description of the scope of the data elements that you need (e.g., data supporting specific treatment options vs. the full range of options, data supporting the entire country vs. a specific geographic region)	X		X				Data used for the WA documented in PQAPP Section 3.1.
If project includes development or update of a project database, QAPP identifies and defines each database field		X					Data used for the WA documented in PQAPP Section 3.1.
B2. Potential Data Sources							
Identifies and describes potential sources of the existing data needed (e.g., photographs, topographical maps, facility or state files, census data, meteorological data, publications, etc.) and the rationale for their use	X		X				Data used for the WA documented in PQAPP Section 3.1. Any new data that will be used for the WA that is not in the current PQAPP will be added in the next revision to the PQAPP.
If literature searches are used, describes the search engines that will be used and key search terms	X		X				Data used for the WA documented in PQAPP Section 3.1.

QAPP Element	A = Applicable N/A = Not applicable		Covered in PQAPP?	Covered in SQAPP?	Ac = Acceptable NAc = Not Acceptable		Comments
	A	N/A			Ac	NAc	
If databases or models will be used, describe the database (or model) in terms of who developed it and operates it and the type of data it contains	X		X				Data used for the WA documented in PQAPP Section 3.1. Any new data that will be used for the WA that is not in the current PQAPP will be added in the next revision to the PQAPP.
For other potential sources, describe the potential sources and rationale for considering or using each one	X		X				Data used for the WA documented in PQAPP Section 3.1. Any new data that will be used for the WA that is not in the current PQAPP will be added in the next revision to the PQAPP.
B3. Criteria for Selecting Data Sources							
Identifies each criterion that will be used to determine if the candidate data sources listed in B2 will meet your needs, and how each criterion is defined. (Criteria vary by project; examples include reliability, age, applicability, quantity, format, and others)	X		X				Documented in PQAPP Section 3.1. Any new data criteria that will be used for the WA that is not in the current PQAPP will be added in the next revision to the PQAPP.
Explains rating system used to evaluate source against each criterion	X		X				Documented in PQAPP Section 3.1. Any new data criteria that will be used for the WA that is not in the current PQAPP will be added in the next revision to the PQAPP.
B4. Data Value Selection Approach							
For data sources that meet the criteria identified in B3: Describes the criteria and procedures that will be used to determine which value(s) identified in the acceptable sources are most appropriate for use in the project	X		X				Documented in PQAPP Section 3.1.

QAPP Element	A = Applicable N/A = Not applicable		Covered in PQAPP?	Covered in SQAPP?	Ac = Acceptable NAc = Not Acceptable		Comments
	A	N/A			Ac	NAc	
For data that do not meet these pre-established criteria but are the only data available, explains how the decision to use such data will be made and documented	X		X				Documented in PQAPP Section 3.1.
B5. Resolving Data Gaps							
Describes the process for identifying and addressing data gaps that still exist after candidate data sources have been evaluated and appropriate data values have been identified	X		X				Documented in PQAPP Section 3.1.
Describes the process that will be used to address any new data needs revealed during the data gathering process (i.e., additional data elements not previously considered)	X						Documented in PQAPP Section 3.1.
B6. Data Gathering Documentation and Records							
Describes how results of the source selection and the data value selection will be documented, including any sources or values that were rejected and the rationale for not using them	X		X				Documented in PQAPP Section 3.1.
For data that are deemed acceptable and that will be used, explains how each data element will be associated to its original source citation (i.e., bibliographic information, telephone contact reports, email messages, etc.)	X		X				Documented in PQAPP Section 3.1.

QAPP Element	A = Applicable N/A = Not applicable		Covered in PQAPP?	Covered in SQAPP?	Ac = Acceptable NAc = Not Acceptable		Comments
	A	N/A			Ac	NAc	
C1. Standardization of Data Elements							
Describes the process to ensure that units and other key measures are captured and standardized (or otherwise made comparable) in the database	X		X				Documented in PQAPP Section 3.2.
If the project requires that all fields be standardized to a single set of units (e.g., US dollars for economic data, ug/L for chemical data), identifies the standard units that will be required for each data element	X		X				Documented in PQAPP Section 3.2.
Identifies the procedures for converting data reported in other units to the standardized units, including any rounding or truncating procedures, and procedures for ensuring these conversions are performed correctly	X		X				Documented in PQAPP Section 3.2.
If standardization of data elements is not needed, explains the process for ensuring that data presented in varying units are comparable enough for use in the project and that project staff members and other data users will be able to readily identify differences in units	X		X				Documented in PQAPP Section 3.2.
C2. Data Entry							
Explains the process for manually entering selected data into the project database, who will be responsible for such data entry, and the QC strategies that will be used to ensure that the database accurately and completely captures the data as presented in the original source	X		X				Data entry methods for the WA are documented in PQAPP Section 3.2.

QAPP Element	A = Applicable N/A = Not applicable		Covered in PQAPP?	Covered in SQAPP?	Ac = Acceptable NAc = Not Acceptable		Comments
	A	N/A			Ac	NAc	
C3. Merging or Uploading Electronic Data from Existing Sources							
If data are available electronically and will be uploaded or merged into the project database: describes the procedures that will be followed to ensure that errors are not introduced during the upload/merge process and that the final database reflects the original dataset(s)	X		X				Data entry methods for the WA are documented in PQAPP Section 3.2.
C4. Data Review							
Describes the process for ensuring that the data have been recorded, transmitted, and processed correctly	X		X				Data review for the WA are documented in PQAPP Section 3.2.
C5. Data Storage and Manipulation							
Describes how the existing data will be stored	X		X				Documented in PQAPP Section 3.2.
Describes who will be responsible for access to and maintenance of the stored data	X		X				Documented in PQAPP Section 3.2.
Describes how the existing data will be incorporated with other project data to support the project goal/decision to be made	X		X				Documented in PQAPP Section 3.2.
Describes the QC strategies that will be employed to ensure that the integrity of the data is not compromised during data storage, access/retrieval, updates, or other manipulation	X		X				Documented in PQAPP Section 3.2.

QAPP Element	A = Applicable N/A = Not applicable		Covered in PQAPP?	Covered in SQAPP?	Ac = Acceptable NAc = Not Acceptable		Comments
	A	N/A			Ac	NAc	
D1. Data Quality Verification and Data Quality Reporting							
Describes the process for verifying that the final set of data meets the overall criteria originally specified for the project	X		X				Data quality verification steps for the WA are documented in PQAPP Section 3.3.
Describes how these determinations will be documented and reported.	X		X				Documented in PQAPP Section 3.3.
For data that don't meet the pre-established specifications, explains the process for determining if they are usable and how such decisions will be documented	X		X				Documented in PQAPP Section 3.3.
D2. Use/Analysis of the Existing Data							
Provides details regarding the exact means in which the data will be used to meet project objectives	X		X				Documented in PQAPP Section 3.2.2.
Includes an explanation or list of the information to be calculated and the data elements that will be used to make those calculations	X		X				Documented in PQAPP Section 3.2.2.
Includes applicable calculations and equations (if known) or explanations of how they will be developed.	X		X				Documented in PQAPP Section 3.2.2.
Includes plans for excluding outliers.	X		X				Documented in PQAPP Section 3.2.2.
D3. Methodology Documentation and Conceptual Review							
If exact methodologies for analyzing the data will need to be developed or modified during the course of data analysis, explains the process by which such methodologies will be documented, who is responsible for reviewing/ approving their use, and how the methodologies will be checked to ensure they yield the desired products	X		X				Documented in PQAPP Section 3.2.3.

QAPP Element	A = Applicable N/A = Not applicable		Covered in PQAPP?	Covered in SQAPP?	Ac = Acceptable NAc = Not Acceptable		Comments
	A	N/A			Ac	NAc	
D4. Technical Review of the Data Analysis							
Describes activities that will be used to ensure the data analyses are being implemented as specified and will support project objectives	X		X				Technical review of data analysis for the WA are documented in PQAPP Section 3.3
Explains procedures for identifying and notifying appropriate personnel if changes to the originally planned procedures are warranted, and the process for approving, documenting and implementing such changes	X		X				Technical review of data analysis for the WA are documented in PQAPP Section 3.3
D5. Final Verification of Data Analysis and Reconciliation with User Requirements							
Describes the process for reviewing the final work product to ensure that the work was generated in accordance with the QAPP, and that the work product addresses the overall project goals and objectives	X		X				Final verification of data analysis for the WA are documented in PQAPP Section 3.3
Describes how the results of this assessment will be documented	X		X				Final verification of data analysis for the WA are documented in PQAPP Section 3.3
Describes how any limitations of the data or data analyses that were used to prepare the final work product will be documented and communicated	X		X				Final verification of data analysis for the WA are documented in PQAPP Section 3.3

EPA

United States Environmental Protection Agency
Washington, DC 20460

Work Assignment

Work Assignment Number: 3-02

☐ Other ☐ Amendment Number:

Contract Number	Contract Period	Title of Work Assignment/SF Site Name
EP-C-13-039	09/11/2013 To 07/31/2017 Base Option Period Number 3	SW & GI Analytical Support

Contractor	Specify Section and paragraph of Contract SOW
ABT ASSOCIATES INC.	Section 2, paragraph 2

Purpose:
- [X] Work Assignment
- [ ] Work Assignment Amendment
- [X] Work Plan Approval
- [ ] Work Assignment Close-Out
- [ ] Incremental Funding

Period of Performance: From 09/08/2016 To 07/31/2017

Comments:

☐ Superfund — Accounting and Appropriations Data — [X] Non-Superfund

Note: To report additional accounting and appropriations date use EPA Form 1900-69A.

SFO (*Max 2*) ☐

Line	DCN (Max 6)	Budget/FY (Max 4)	Appropriation Code (Max 6)	Budget Org/Code (Max 7)	Program Element (Max 9)	Object Class (Max 4)	Amount (Dollars)	(Cents)	Site/Project (Max 8)	Cost Org/Code
1										
2										
3										
4										
5										

Authorized Work Assignment Ceiling

	Cost/Fee	LOE
Contract Period: 09/11/2013 To 07/31/2017	$0.00	0
This Action:	$47,276.00	345
Total:	$47,276.00	345

Work Plan / Cost Estimate Approvals

	Cost/Fee	LOE
Contractor WP Dated: 09/20/2016	$47,276.00	345
Cumulative Approved:	$47,276.00	345

Work Assignment Manager Name: Todd Doley (Signature) (Date)		Branch/Mail Code: Phone Number: 202-566-1160 FAX Number:
Project Officer Name: Ahmar Siddiqui (Signature) (Date)		Branch/Mail Code: Phone Number: 202-566-1044 FAX Number:
Other Agency Official Name (Signature) (Date)		Branch/Mail Code: Phone Number: FAX Number:
Contracting Official Name: Tammy Adams TAMMY ADAMS Digitally signed by TAMMY ADAMS DN: c=US, o=U.S. Government, ou=USEPA, ou=Staff, cn=TAMMY ADAMS, dnQualifier=0000018417 Date: 2016.10.04 09:58:00 -04'00' (Signature) (Date)		Branch/Mail Code: Phone Number: 513-487-2030 FAX Number: 513-487-2545

EPA

United States Environmental Protection Agency
Washington, DC 20460

Work Assignment

Work Assignment Number: 3-03

☐ Other ☐ Amendment Number:

Contract Number	Contract Period	Title of Work Assignment/SF Site Name
EP-C-13-039	09/11/2013 To 07/31/2017 Base Option Period Number 3	Environmental Impact and Benef

Contractor	Specify Section and paragraph of Contract SOW
ABT ASSOCIATES INC.	Paragraphs B.1, C.1, and G

Purpose:
- [X] Work Assignment
- [ ] Work Assignment Amendment
- [ ] Work Plan Approval
- [ ] Work Assignment Close-Out
- [ ] Incremental Funding

Period of Performance: From 09/12/2016 To 07/31/2017

Comments:

☐ Superfund — Accounting and Appropriations Data — [X] Non-Superfund

SFO (*Max 2*): ☐

Note: To report additional accounting and appropriations date use EPA Form 1900-69A.

Line	DCN (Max 6)	Budget/FY (Max 4)	Appropriation Code (Max 6)	Budget Org/Code (Max 7)	Program Element (Max 9)	Object Class (Max 4)	Amount (Dollars)	(Cents)	Site/Project (Max 8)	Cost Org/Code
1										
2										
3										
4										
5										

Authorized Work Assignment Ceiling

	Cost/Fee	LOE
Contract Period: 09/11/2013 To 07/31/2017		0
This Action:		180
Total:		180

Work Plan / Cost Estimate Approvals

Contractor WP Dated:	Cost/Fee	LOE:
Cumulative Approved:	Cost/Fee	LOE:

Work Assignment Manager Name: Ashley Allen (Signature) (Date)	Branch/Mail Code: Phone Number: 202-566-1012 FAX Number:
Project Officer Name: Ahmar Siddiqui (Signature) (Date)	Branch/Mail Code: Phone Number: 202-566-1044 FAX Number:
Other Agency Official Name (Signature) (Date)	Branch/Mail Code: Phone Number: FAX Number:
Contracting Official Name: Tammy Adams TAMMY ADAMS Digitally signed by TAMMY ADAMS DN: c=US, o=U.S. Government, ou=USEPA, ou=Staff, cn=TAMMY ADAMS, dnQualifier=0000018417 Date: 2016.09.12 10:47:50 -04'00' (Signature) (Date)	Branch/Mail Code: Phone Number: 513-487-2030 FAX Number: 513-487-2545

WORK ASSIGNMENT

I. Title: ***Environmental Impact and Benefit Assessment of Measures Addressing Stormwater Discharges from Developed Areas***

Contractor: Abt Associates **Contract No.:** EP-C-13-039

II. Work Assignment Number: 3-03

III. Estimated Period of Performance: Date of Issuance through July 31, 2017

IV. Estimated Level of Effort: 180 hours

V. Key EPA Personnel:

Work Assignment Contracting Officer's Representative (WACOR):
Ashley Allen
OST/EAD (4303T)
202/566-1012
202/566-1053 (fax)

VI. Background and Purpose:

Stormwater runoff from developed areas is a significant source of pollutants and other stressors for waters of the United States. Urbanization and the associated increase in impervious surface area fundamentally change watershed hydrology and degrade aquatic ecosystems over time.

EPA developed its existing stormwater regulations as directed under Section 402(p) of the Clean Water Act (CWA). Regulated entities comply with existing regulations through the use of a wide variety of programs and best management practices (BMPs). Under Section 402(p)(6), EPA is authorized to designate additional stormwater discharges to be regulated and to establish a comprehensive program for their management.

Under Executive Orders 12866 and 13563, EPA is required to estimate the potential benefits and costs to society. As such, the purpose of this Work Assignment (WA) is to provide technical support for documentation of an analysis of the environmental impact associated with stormwater discharges from developed areas and of the benefit associated with their reduction. This analysis, conducted under prior WAs, provides both a qualitative description and a quantitative estimate of environmental impacts and benefits. The analysis examines both baseline conditions and incremental changes associated with each of several options for addressing stormwater discharges.

Under this work assignment the contractor shall conduct all analyses requiring the collection and manipulation of data and models in accordance with the EPA-approved quality assurance (QA) project plan that was previously developed. The QA project plan describes the procedures for assuring the quality of the primary and secondary environmental data used for this WA.

In carrying out the tasks specified in this work assignment, the contractor may be called upon to build upon and continue work performed under WAs 0-03, 1-03, and 2-03 under this Contract (EP-C-13-039). The work performed under this work assignment will not duplicate work conducted under the previous work assignments.

Under the previous work assignment(s), Abt Associates performed the following analyses:

- Completed environmental impact and benefits analysis as described above (WAs 0-03 and 1-03).
- Initiated creation of draft documentation of the environmental impact and benefits analysis (WA 2-03).

VII. General Requirements of the Work Assignment and Schedule

Confidential Business Information: During the course of the work assignment, the contractor will not be accessing and evaluating CBI.

Budget Reporting: The contractor under this work assignment is required to report to the EPA WACOR and Contract-Level Contracting Officer's Representative (CL-COR) when 75 percent of the total work assignment funding amount has been depleted. The contractor must also report to the EPA WACOR when 75 percent of the approved Work plan budget has been depleted.

Identification as Contracting Staff: To avoid the perception that contractor personnel are EPA employees, contractor personnel shall be clearly identified as independent contractors of EPA when participating in events with outside parties and prior to the start of any meeting. Contractor personnel are prohibited from acting as the Agency's official representative. When speaking with the public, the contractor should refer all interpretations of policy to the EPA WACOR.

Limitation of Contractor Activities: The contractor will submit drafts of all deliverables to the EPA WACOR for review prior to submission of the final product. These drafts will clearly specify the methods, procedures, considerations, assumptions, relevant citations, data sources and data that support any conclusions and recommendations. The contractor will incorporate all EPA WACOR comments into all final deliverables, unless otherwise agreed upon by the EPA WACOR. The contractor will adhere to all applicable EPA management control procedures as implemented by the EPA Contracting Officer (CO), EPA CL-COR, and EPA WACOR.

Quick Response: Under this Performance Work Statement the contractor may be required to provide information for use by EPA for quick responses and analyses of options, issues, and policy decisions. Quick responses are those which require completion in one to five working days.

Travel: EPA does not anticipate the need for non-local travel by contractor employees and/or subcontractors to support the scope of this work assignment.

Deliverable Formatting: All memos, draft comments, summaries and responses, and chapters are to be provided in electronic form using Word and/or Excel/Access, ArcView, or, in special cases another software program agreed to by EPA. Memos are to be written in a manner which will make them easy to turn into draft chapters for the Final Report. For deliverables that are in Word or pdf versions of Word documents, that are intended to be shared with management or the public, the contractor shall use decimal align in all tables containing columns of numbers of varying digits, whether decimal places are reported or not. All final materials, e.g., memos, chapters, etc. are to be prepared only after receiving written technical direction from the EPA WACOR and will be formatted to be in compliance with the Section 508 Amendment to the Rehabilitation Act of 1973.

VIII. Performance Work Statement

The EPA WACOR will review all deliverables in draft form and provide revisions and/or comments to the contractor. The contractor shall prepare the final deliverables incorporating the EPA WACOR's comments.

Task 1 - Prepare Work Plan

The contractor shall prepare a work plan within 15 calendar days of receipt of the work assignment. The work plan shall outline, describe and include the technical approach, resources, timeline and due dates for deliverables, a detailed cost estimate by task, and a staffing plan. The EPA WACOR, the CL-COR and the CO will review the work plan. However, only the CO can approve/disapprove, suggest revisions, or change the work plan. Official revisions will be given to the contractor by the CO. The contractor shall prepare a revised work plan incorporating the CO's comments, if required.

A biweekly update call with the EPA WACOR will be required for this work assignment to discuss progress on deliverables, costs, and other potential issues.

Deliverables and schedule under Task 1

1a. Work plan within 15 calendar days of receipt of work assignment.
1b. Biweekly Update Call

Task 2 - Quality Assurance

2.1 Background

Quality Assurance Project Plans are required under the Agency's Quality Assurance Policy CIO-2105, formerly EPA Order 5360.1 A2 (May 2000), and implementing guidance CIO-2105-P-01-0 (May 2000). All projects that involve the generation, collection, analysis, and use of

environmental data must have an approved Quality Assurance Project Plan (QAPP) in place prior to the commencement of the work. Examples of these environmental data operations are provided in **Table 2-1** below.

Table 2-1. Examples of work that involves the collection, generation, evaluation, analysis, or use of environmental data

Item	Examples
Data	Includes field sampling information (sample location information, flow measurements, temperature, pH, physical observations, etc.), laboratory measurements (e.g., chemical, physical, biological, radiological measurements), data collected from questionnaires, economic data, census data, and any other types of existing data (i.e., data generated for a different purpose or generated by a different organization)
Data generation	Includes field studies, laboratory studies, and generation of modeling output
Data collection	Includes field surveys, questionnaire surveys, literature searches, and third party data
Data evaluation	Includes data inspection, review, assessment, and validation
Data analysis	Includes statistical, engineering, and economic analysis, and testing, evaluation, and validation of methods and models; database creation, data extraction, and data manipulation
Data Use	Any use of data to support EPA decisions, regulations, policy, publications, or tools (including effluent guidelines, 304(m) program, standards, environmental assessments, and models, tools, or reports disseminated by EPA to assist other organizations in implementing environmental programs)

Note that QAPPs are required for the development or revision of models and software that support the generation, collection, evaluation, analysis, or use of data. (A model is set of equations and assumptions used to predict unknown data.) When existing models are used as a tool to generate or evaluate data, the project QAPP must describe the model and explain how it will be used and how its output will be evaluated to ensure the modeling effort meets the overall quality objectives for the project. Development or revision of new models also must be supported by a QAPP that describes the objectives for the model, the quality criteria that will be applied to the model, and the procedures for evaluating whether the model meets those criteria.

2.2 QA Project Plan Requirements

The contractor has previously prepared a contract-wide Programmatic QAPP (PQAPP) for Contract EP-C-13-039. This PQAPP describes, in a single document, information that is not site or time-specific, but applies throughout the program (i.e., the duration of the contract). When tasked with preparing the PQAPP, the contractor was informed that the PQAPP may need to be supplemented with project-specific details to support individual work assignments that involve the collection, generation, evaluation, analysis, or use of environmental data.

The activities in this WA involve gathering, evaluating, analyzing, and otherwise using existing environmental and economic data (also known as "secondary" use of data). EPA has determined that the contractor is operating under the existing PQAPP and that the PQAPP addresses QA requirements for this WA. In support of this WA, the contractor shall ensure that the work plan provides enough detail to clearly describe:

- Specific objectives of the project(s) supported by this WA such as researching data sources and models, evaluating and processing data, documenting data processing and quality, assembling, evaluating, and implementing model collections; assessment of model results;
- The type of data to be gathered or used under this WA to support the project objectives—including data from search engines, federal databases, and EPA data bases—as well as a rationale for when those databases are appropriate and what data available in each will support the project;
- The quality objectives needed to ensure the data will support the project objectives; and,
- The QA/QC activities to be performed to ensure that any results obtained are documented and are of the type, quality, transparency, and reproducibility needed.

Table A-1 in the Appendix to this WA demonstrates how the PQAPP addresses QA requirements for this WA.

The contractor shall fill in staff roles to the Table A-1 checklist under Row A.4 and make any additional detailed notes in the 'explanatory comments' column as requested by the WACOR, when this information differs from the existing PQAPP (*Programmatic Quality Assurance Project Plan (PQAPP) for Economic, Environmental, and Regulatory Analytical and Evaluation Support for Clean Water Regulations* (Contract No. EP-C-13-039), December 21, 2015, Revision 2). When this information does not differ from the existing PQAPP the contractor should simply cite the PQAPP. The contractor shall then include the completed Table A-1 as a separate Appendix A to the work plan upon submittal to EPA. This Appendix A will be a stand-alone document when QA documentation is required to support EPA regulatory activities, therefore the Table A-1 title must include the title of the WA, WA number, contract number, and what projects each covers. The WACOR has provided this information in the title, which the contractor may use to fulfill this requirement.

2.3 Additional QA Documentation Required

The EPA Quality Manual for Environmental Programs (CIO 2105-P-01-0, May 2000) requires published Agency reports containing environmental data to be accompanied by a readily identifiable section or appendix that discusses the quality of the data and any limitations on the use of the data with respect to their originally intended application. The EPA Quality Manual further requires Agency reports to be reviewed by the QA manager (or other authorized official) before publication to ensure that an adequate discussion of QA and QC activities is included. The purpose of the review is to ensure that the reports provide enough information to enable a knowledgeable reader to determine whether the technical and quality goals were met for the intended use of the data. Reports should include applicable statements regarding the use of any environmental data presented as a caution about possible misuse of the data for other purposes. For example, a Technical Support Document or Study Report must include a clear discussion of the quality management strategies (including the project goals and objectives, quality objectives and criteria, and QA/QC practices) that were employed to control and document the quality of data generated and used. These documents should also discuss any deviations from procedures documented in the EPA-approved QAPP(s) supporting the project, the reasons for those deviations, any impact of those deviations had on data quality, and steps taken to mitigate data

quality issues.

In support of this Agency requirement, all major deliverables (e.g., Technical Support Documents, Study Reports, Analytical Methods) produced by the contractor under this WA must include a discussion of the QA/QC activities that were performed to support the deliverable. This discussion must provide a sufficient level of detail to allow the Engineering and Analysis Division (EAD) QA Coordinator (or designee) to determine whether the QA/QC strategies implemented for the project sufficiently support the intended use of the data. Upon receipt, the EPA WACOR will review each applicable report and certify whether the contractor has adhered to the QA requirements documented in the contractor's PQAPP.

The contractor also shall provide EPA with monthly reports of QA activities performed during implementation of this WA. These monthly QA reports shall identify QA activities performed to support implementation of this WA, problems encountered, deviations from the QAPP, and corrective actions taken. If desired, the contractor may include this report as a part of the contract-required monthly financial/technical progress report.

2.4 Data Quality Act/Information Quality Guidelines Requirements

The Data Quality Act (also known as the Information Quality Act) requires EPA to ensure that influential information disseminated by the Agency is sufficiently transparent in terms of data and methods of analysis so that the information is capable of being substantially reproduced. To support compliance with these data transparency/data reproducibility requirements, EPA plans to include QAPPs as part of any rulemaking record documentation to be made available to the public. (This includes PQAPPs and Supplemental Quality Assurance Project Plans (SQAPPs).) The contractor may claim information in QAPPs as confidential; if the contractor chooses to do so, the contractor shall submit a sanitized (i.e., public) version and an unsanitized (i.e., confidential) version at the time the QAPP is submitted for approval by EPA. The sanitized version shall be included in the public docket for the applicable rulemaking (or other docket record), and the unsanitized version shall be included in a non-public (i.e., confidential) portion of the docket (or record).

Information contained in the approved QAPP shall be transparent and reproducible and meet the requirements of the Data Quality Act for influential information. EPA's *Guidelines for Ensuring and Maximizing the Quality, Objectivity, Utility, and Integrity, of Information Disseminated by the Environmental Protection Agency* (EPA/260R-02-008, October 2002), referred to as "EPA's Information Quality Guidelines," describe EPA procedures for meeting Data Quality Act requirements. Section 6.3 of EPA's Information Quality Guidelines indicate that "especially rigorous robustness checks" should be applied in circumstances where quality-related information cannot be disclosed due to confidentiality issues. Where applicable, the contractor should indicate which results were obtained using the tools (SOPs, checklists, and guidelines) that the contractor designates as confidential so that the EPA WACOR can easily identify the areas that shall require rigorous robustness checks and document that those checks have been performed. At the discretion of the EPA WACOR, the contractor may be requested to prepare pre-dissemination review checklist as described in Section 5.5 of the Office of Water Quality Management Plan, March 2015. If this is required, the EPA WACOR will notify the contractor

through written technical direction.

Deliverables and Schedule under Task 2

Deliverable	Projected Schedule Date
Monthly reports of QA work performed (may be included in the Contractor's monthly progress report)	Monthly throughout the WA period of performance

Task 3 - Prepare Standardized Naming Convention and Version Control Memorandum

The contractor shall adhere to the EPA WACOR approved standardized naming convention and version control (SNCVC) plan that was developed under the Construction and Development WA 0-01 of the contract EP-C-07-023 (WA0-01_T1_SNCVC_08.31.07_V1.pdf). The contractor shall use this standardized convention for all deliverables associated with this work assignment.

The EPA WACOR may request the contractor through written technical direction to amend the SNCVC memorandum at any point under this WA. The EPA WACOR will review the revised memorandum and then provide the contractor with written notification of approval or edits that need to be made. The contractor shall prepare the edited SNCVC memorandum incorporating the EPA WACOR's comments, if required. After receiving notification of approval the contractor shall use the revised SNCVC.

Deliverables and schedule under Task 3

3. If required, revised memorandum within 3 calendar days of receipt of comments from the EPA WACOR, at technical direction of EPA WACOR.

Task 4 – Documentation of Quantitative Analyses of Surface Water Effects from Developed Area Stormwater Discharges

Under this task, the contractor shall complete preparation of preliminary documentation describing the methodology for quantifying the surface-water effects of stormwater controls and discussing the outputs of the analysis for the watersheds analyzed under WA 1-03. The documentation shall be prepared to a level sufficient for internal review by US EPA. The documentation will discuss the limitations and uncertainty of the results and the outputs and implications of model sensitivity analyses. In addition, the documentation will describe studies from the published literature in order to provide context for the modeling methodology and results. This literature review will be limited to identifying a select number of studies that address the most novel aspects of the analysis' methodology and results.

EPA anticipates that the documentation will discuss the scenarios analyzed under WA 1-03 and that there will be no need to run and analyze new scenarios in order to produce the documentation requested under this task.

The documentation shall consist of chapter(s) formatted in the same general manner as the draft chapters produced under WA 1-03 for land-based benefits (discussed in Task 5 below). EPA anticipates that the documentation will be less than 100 pages in length, but the contractor shall use their best judgment in determining the appropriate length. The contractors shall use the draft documentation prepared under WA 2-03 as the starting point for preparing documentation under this WA.

Deliverables

4a. Draft Version – 60 days after receipt of technical direction from WACOR
4c. Final Version – 30 days after receipt of technical direction from WACOR

Task 5 – Documentation of Quantitative Analyses of Land-Based Environmental Changes from Use of Best Management Practices for Developed Area Stormwater Discharges

Under this task, the contractor shall revise the draft documentation describing the analysis of land-based environmental changes and benefits which the contractor delivered to EPA and for which the EPA WACOR provided comments under WA 1-03. The documentation shall be prepared to a level sufficient for internal review by EPA. EPA does not anticipate any need to analyze any additional scenarios in order to produce documentation under this task.

Deliverables

5a. Revised Version – 30 days after receipt of technical direction from WACOR

Appendix
EAD Checklist for Projects Utilizing Existing Data

The items noted in this checklist are adapted from those elements found in *EPA Requirements for QA Project Plans (QA/R-5)* (EPA, 2001a), but tailored to the use of existing data.

Table A1. QAPP Elements Applicable to WA 3-03 ("Environmental Impact and Benefit Assessment of Measures Addressing Stormwater Discharges from Developed Areas") of Contract EP-C-13-039 for Projects Utilizing Existing Data

QAPP Element	Sufficiently Addressed in PQAPP	Not Applicable to Project	Explanatory Comments
A1. Title & Approval Sheet			
Project title			Environmental Impact and Benefit Assessment of Measures Addressing Stormwater Discharges from Developed Areas
Organization's name	X		
Effective date and/or version identifier	X		
Dated signature of Organization's project manager	X		
Dated signature of Organization's QA manager	X		
Other signatures, as needed (e.g., EAD Project Officer, EAD QA Coordinator)	X		
Revision History	X		
A2. Table of Contents			
Includes sections, figures, tables, references, and appendices	X		PQAPP pp. vii-viii
Document control information indicated (when required by the EPA Project Manager and QA Manager)	X		
A3. Distribution List			
Includes all individuals who are to implement or otherwise receive the QAPP and identifies their organization	X		PQAPP p. iv
A4. Project/Task Organization			
Identifies key individuals with their responsibilities (e.g., data users, decision makers, project QA manager, Subcontractors, etc.) and contact info.	X		PQAPP section 2.1 *List specific people identified for the following roles:* *PQA:* *Abt WAM:* *EPA WACOR: Ashley Allen*
Organization chart shows lines of authority & reporting responsibilities	X		PQAPP Section 2.1
Project QA manager position indicates independence from unit collecting/using data	X		PQAPP Section 2.1
A5. Problem Definition/Background			
Clearly states problem to be resolved, decision to be made, or hypothesis to be tested	X		PQAPP Section 2.2 and address in Work Plan.
Identifies project objectives or goals	X		PQAPP Table 2.2 and address in Work Plan.
Historical & background information	X		PQPP Section 2.2 and address in Work Plan.

QAPP Element	Sufficiently Addressed in PQAPP	Not Applicable to Project	Explanatory Comments
Cites applicable technical, regulatory, or program-specific quality standards, criteria, or objectives	X		PQAPP Section 2.2 and address in Work Plan.
A6. Project/Task Description			
List measurements to be made/data to obtain	X		PQAPP Section 2.3, and address in Work Plan.
Notes special personnel or equipment requirements	X		PQAPP Section 2.5
Provides work schedule		X	Addressed in Work Plan. No set dates or work sequence.
A7. Overall Quality Objectives & Criteria			
States overall quality objectives and limits needed to support the project goals and objectives cited in A5	X		PQAPP Section 2.4 and address in Work Plan.
A8. Special Training Requirements/ Certifications			
Identifies specialized skills, training or certification requirements	X		PQAPP Section 2.5
Discusses how this training will be provided/the necessary skills will be assured and documented	X		PQAPP Section 2.5
A9. Project-level Documents & Records			
Describes process for distributing the approved QAPP and other planning documents (and updates) to staff	X		PQAPP p. iv and Section 2
Identifies final work products that will result from the project	X		PQAPP Section 2.6 and address in Work Plan.
Describes the process for developing, reviewing, approving, and disseminating the final work products and individuals responsible for these processes	X		PQAPP Section 2.6 and address in Work Plan.
B1. Data Needs			
Detailed list/description of the specific data elements needed to support project goals	X		PQAPP Table 3-1 and address in work plan.
Description of the scope of the data elements that you need (e.g., data supporting specific treatment options vs. the full range of options, data supporting the entire country vs. a specific geographic region)	X		PQAPP Table 3-1 and address in work plan.
If project includes development or update of a project database, QAPP identifies and defines each database field	X		
B2. Potential Data Sources			
Identifies and describes potential sources of the existing data needed (e.g., photographs, topographical maps, facility or state files, census data, meteorological data, publications, etc.) and the rationale for their use	X		PQAPP Section 3.1.2 and address in Work Plan.
If literature searches are used, describes the search engines that will be used and key search terms	X		PQAPP Section 3.1.2
If databases or models will be used, describe the database (or model) in terms of who developed it and operates it and the type of data it contains			PQAPP Section 3.1.2

QAPP Element	Sufficiently Addressed in PQAPP	Not Applicable to Project	Explanatory Comments
For other potential sources, describe the potential sources & rationale for considering or using each one			PQAPP Section 3.1.2
B3. Criteria for Selecting Data Sources			
Identifies each criterion that will be used to determine if the candidate data sources listed in B2 will meet your needs, and how each criterion is defined. (Criteria vary by project; examples include reliability, age, applicability, quantity, format, and others)	X		PQAPP Section 3.1.3
Explains rating system used to evaluate source against each criterion		X	
B4. Data Value Selection Approach			
For data sources that meet the criteria identified in B3: Describes the criteria and procedures that will be used to determine which value(s) identified in the acceptable sources are most appropriate for use in the project	X		PQAPP Section 3.1.4
For data that do not meet these pre-established criteria but are the only data available, explains how the decision to use such data will be made and documented		X	
B5. Resolving Data Gaps			
Describes the process for identifying and addressing data gaps that still exist after candidate data sources have been evaluated and appropriate data values have been identified	X		PQAPP Section 3.1.5
Describes the process that will be used to address any new data needs revealed during the data gathering process (i.e., additional data elements not previously considered)		X	
B6. Data Gathering Documentation and Records			
Describes how results of the source selection and the data value selection will be documented, including any sources or values that were rejected and the rationale for not using them	X		PQAPP Section 3.1.6 (p. 49) and Section 4.1.1
For data that are deemed acceptable and that will be used, explains how each data element will be associated to its original source citation (i.e., bibliographic information, telephone contact reports, email messages, etc.)	X		PQAPP Section 3.1.6, p. 49
C1. Standardization of Data Elements			
Describes the process to ensure that units and other key measures are captured and standardized (or otherwise made comparable) in the database	X		PQAPP Section 3.2.1
If the project requires that all fields be standardized to a single set of units (e.g., US dollars for economic data, µg/L for chemical data), identifies the standard units that will be required for each data element	X		PQAPP Section 3.2.1

QAPP Element	Sufficiently Addressed in PQAPP	Not Applicable to Project	Explanatory Comments
Identifies the procedures for converting data reported in other units to the standardized units, including any rounding or truncating procedures, and procedures for ensuring these conversions are performed correctly	X		PQAPP Section 3.2.1
If standardization of data elements is not needed, explains the process for ensuring that data presented in varying units are comparable enough for use in the project and that project staff members and other data users will be able to readily identify differences in units	X		PQAPP Section 3.2.1
C2. Data Entry			
Explains the process for manually entering selected data into the project database, who will be responsible for such data entry, and the QC strategies that will be used to ensure that the database accurately and completely captures the data as presented in the original source	X		PQAPP Section 3.2.2
C3. Merging or Uploading Electronic Data from Existing Sources			
If data are available electronically and will be uploaded or merged into the project database: describes the procedures that will be followed to ensure that errors are not introduced during the upload/merge process and that the final database reflects the original dataset(s)	X		PQAPP Section 3.2.3
C4. Data Review			
Describes the process for ensuring that the data have been recorded, transmitted, and processed correctly	X		PQAPP Section 3.2.4
C5. Data Storage and Manipulation			
Describes how the existing data will be stored	X		PQAPP Section 3.2.5
Describes who will be responsible for access to and maintenance of the stored data	X		PQAPP Section 3.2.5
Describes how the existing data will be incorporated with other project data to support the project goal/decision to be made	X		PQAPP Section 3.2.5
Describes the QC strategies that will be employed to ensure that the integrity of the data is not compromised during data storage, access/retrieval, updates, or other manipulation	X		PQAPP Section 3.2.5
D1. Data Quality Verification and Data Quality Reporting			
Describes the process for verifying that the final set of data meets the overall criteria originally specified for the project	X		PQAPP Section 3.3.1
Describes how these determinations will be documented and reported	X		PQAPP Section 3.3.1
For data that don't meet the pre-established specifications, explains the process for determining if they are usable and how such decisions will be documented	X		PQAPP Section 3.3.1

QAPP Element	Sufficiently Addressed in PQAPP	Not Applicable to Project	Explanatory Comments
D2. Use/Analysis of the Existing Data			
Provides details regarding the exact means in which the data will be used to meet project objectives	X		PQAPP Section 3.3.2
Includes an explanation or list of the information to be calculated and the data elements that will be used to make those calculations	X		PQAPP Section 3.3.2
Includes applicable calculations and equations (if known) or explanations of how they will be developed	X		PQAPP Section 3.3.2
Includes plans for excluding outliers	X		PQAPP Section 3.3.2
D3. Methodology Documentation and Conceptual Review			
If exact methodologies for analyzing the data will need to be developed or modified during the course of data analysis, explains the process by which such methodologies will be documented, who is responsible for reviewing/ approving their use, and how the methodologies will be checked to ensure they yield the desired products	X		PQAPP Section 3.3.3.
D4. Technical Review of the Data Analysis			
Describes activities that will be used to ensure the data analyses are being implemented as specified and will support project objectives	X		PQAPP Section 3.3.4
Explains procedures for identifying and notifying appropriate personnel if changes to the originally planned procedures are warranted, and the process for approving, documenting and implementing such changes	X		PQAPP Section 3.3.4
D5. Final Verification of Data Analysis and Reconciliation with User Requirements			
Describes the process for reviewing the final work product to ensure that the work was generated in accordance with the QAPP, and that the work product addresses the overall project goals and objectives	X		PQAPP Section 3.3.5
Describes how the results of this assessment will be documented	X		PQAPP Section 3.3.5
Describes how any limitations of the data or data analyses that were used to prepare the final work product will be documented and communicated	X		PQAPP Section 3.3.5

EPA

United States Environmental Protection Agency
Washington, DC 20460

Work Assignment

Work Assignment Number: 3-03

☐ Other ☐ Amendment Number:

Contract Number	Contract Period	Title of Work Assignment/SF Site Name
EP-C-13-039	09/11/2013 To 07/31/2017 Base Option Period Number 3	Environmental Impact and Benef

Contractor	Specify Section and paragraph of Contract SOW
ABT ASSOCIATES INC.	Paragraphs B.1, C.1, and G

Purpose:
- [X] Work Assignment
- [ ] Work Assignment Amendment
- [X] Work Plan Approval
- [ ] Work Assignment Close-Out
- [ ] Incremental Funding

Period of Performance: From 09/12/2016 To 07/31/2017

Comments:

☐ Superfund — Accounting and Appropriations Data — [X] Non-Superfund

Note: To report additional accounting and appropriations date use EPA Form 1900-69A.

SFO (*Max 2*) ☐

Line	DCN (Max 6)	Budget/FY (Max 4)	Appropriation Code (Max 6)	Budget Org/Code (Max 7)	Program Element (Max 9)	Object Class (Max 4)	Amount (Dollars)	(Cents)	Site/Project (Max 8)	Cost Org/Code
1										
2										
3										
4										
5										

Authorized Work Assignment Ceiling

	Cost/Fee	LOE
Contract Period: 09/11/2013 To 07/31/2017	$0.00	0
This Action:	$24,255.00	180
Total:	$24,255.00	180

Work Plan / Cost Estimate Approvals

	Cost/Fee	LOE
Contractor WP Dated: 09/27/2016	$24,255.00	180
Cumulative Approved:	$24,255.00	180

Work Assignment Manager Name: Ashley Allen (Signature) (Date)		Branch/Mail Code: Phone Number: 202-566-1012 FAX Number:
Project Officer Name: Ahmar Siddiqui (Signature) (Date)		Branch/Mail Code: Phone Number: 202-566-1044 FAX Number:
Other Agency Official Name (Signature) (Date)		Branch/Mail Code: Phone Number: FAX Number:
Contracting Official Name: Tammy Adams TAMMY ADAMS Digitally signed by TAMMY ADAMS DN: c=US, o=U.S. Government, ou=USEPA, ou=Staff, cn=TAMMY ADAMS, dnQualifier=0000018417 Date: 2016.10.05 13:16:59 -04'00' (Signature) (Date)		Branch/Mail Code: Phone Number: 513-487-2030 FAX Number: 513-487-2545

EPA

United States Environmental Protection Agency
Washington, DC 20460

Work Assignment

Work Assignment Number: 3-04

☐ Other ☐ Amendment Number:

Contract Number	Contract Period	Title of Work Assignment/SF Site Name
EP-C-13-039	09/11/2013 To 07/31/2017 Base Option Period Number 3	316b Exisiting Facilites rule

Contractor	Specify Section and paragraph of Contract SOW
ABT ASSOCIATES INC.	A.6, C.1, C.2 and D

Purpose:
- [X] Work Assignment
- [ ] Work Assignment Amendment
- [ ] Work Plan Approval
- [ ] Work Assignment Close-Out
- [ ] Incremental Funding

Period of Performance: From 08/01/2016 To 07/31/2017

Comments:
Performance on this Work Assignment shall not begin until August 1, 2016.

☐ Superfund — Accounting and Appropriations Data — [X] Non-Superfund

Note: To report additional accounting and appropriations date use EPA Form 1900-69A.

SFO (*Max 2*) ☐

Line	DCN (Max 6)	Budget/FY (Max 4)	Appropriation Code (Max 6)	Budget Org/Code (Max 7)	Program Element (Max 9)	Object Class (Max 4)	Amount (Dollars)	(Cents)	Site/Project (Max 8)	Cost Org/Code
1										
2										
3										
4										
5										

Authorized Work Assignment Ceiling

	Cost/Fee:	LOE:
Contract Period: 09/11/2013 To 07/31/2017		0
This Action:		1,060
Total:		1,060

Work Plan / Cost Estimate Approvals

Contractor WP Dated:	Cost/Fee	LOE:
Cumulative Approved:	Cost/Fee	LOE:

Work Assignment Manager Name: James Covington (Signature) (Date)	Branch/Mail Code: Phone Number: 202-566-1034 FAX Number:
Project Officer Name: Ahmar Siddiqui (Signature) (Date)	Branch/Mail Code: Phone Number: 202-566-1044 FAX Number:
Other Agency Official Name (Signature) (Date)	Branch/Mail Code: Phone Number: FAX Number:
Contracting Official Name: Tammy Adams TAMMY ADAMS (Signature) (Date) Digitally signed by TAMMY ADAMS DN: c=US, o=U.S. Government, ou=USEPA, ou=Staff, cn=TAMMY ADAMS, dnQualifier=0000018417 Date: 2016.07.28 07:24:24 -04'00'	Branch/Mail Code: Phone Number: 513-487-2030 FAX Number: 513-487-2545

Contract No. EP-C-13-039
Work Assignment 3-04

I. Title: Implementation and Benefits Activities for the 316(b) Existing Facilities Rule

Contractor: Abt Associates **Contract No.**: EP-C-13-039

II. Work Assignment Number: 3-04

III. Estimated Period of Performance: August 1, 2016 to July 31, 2017

IV. Estimated Level of Effort: **1,060**

V. Key EPA Personnel: Work Assignment Contracting Officer Representative (WACOR):

Work Assignment Contracting Officer Representative (WACOR):
James C. Covington, III
OST/EAD (4303T)
Phone: (202) 566-1034
Fax: (202) 566-1053
Email: **covington.james@epa.gov**

VI. Background and Purpose of this Work Assignment

The 1972 Clean Water Act (CWA) directs the Environmental Protection Agency (EPA) to develop national technology-based regulations for categories of industries that discharge pollutants directly to surface waters (effluent guidelines) or that discharge pollutants indirectly through sewage treatment plants (pretreatment standards). The CWA also directs EPA to develop national technology-based regulations for new industrial facilities (new source performance standards).

Under Executive Orders 12866 and 13563, EPA is required to estimate the potential benefits and costs to society. As such, the purpose of this Work Assignment (WA) is to provide contract support for work to be performed under WA 3-04, Implementation and Benefits Activities for the 316(b) Existing Facilities Rule. This work assignment includes support for work begun under WAs 1-04 and 2-04, and follows work completed under WA 0-04, Assessment of the Economic Costs and Impacts and Benefits of the Final 316(b) Existing Facilities Rulemaking, under EPA Contract No. EP-C-13-039. The final 316(b) rule was published in the Federal Register in July 2014. The Engineering and Analysis Division (EAD) is working with the Office of Wastewater Management (OWM), which has primary responsibility for implementing the 316(b) rule, to develop implementation and benefits follow-on activities and tools for use by regulated facilities,

permit writers, States and the Regions.

Examples of implementation activities that will be conducted under this WA include assisting other EPA offices within the Office of Water, such as OWM, in responding to economic-related questions they receive about permits and rule implementation from both permit directors and facilities; developing spreadsheet tools to help facilities and permit writers calculate the costs and benefits of various compliance technology options as required under the rule; developing training materials to help State permit directors implement the rule; and, developing outreach materials to help State permit directors assist facilities in preparing the analyses required under the rule. These are only examples of likely 316(b) implementation activities that will require contractor support. In addition, the work assignment provides for contractor support to address EPA comments on the stated preference survey report, which the contractor prepared under WA 6-05 of EP-C-07-023, and to assist EPA with preparations for the Science Advisory Board (SAB) review or review by other external parties of the survey results.

Under this work assignment, the contractor shall conduct all analyses requiring the collection and manipulation of data and models in accordance with the EPA-approved quality assurance (QA) project plan that was based on Task 2 QAPP language. The QA project plan shall describe the procedures for assuring the quality of the primary and existing environmental and economic data used for this work assignment.

In carrying out the tasks specified in this work assignment, the contractor may be called upon to build upon and continue work performed under WAs 0-04, 1-04 and 2-04 under this contract. The work performed under this work assignment shall not duplicate work conducted under the previous work assignments under this contract.

Under the previous work assignments, Abt Associates performed the following analyses, among others:

- Prepared draft cost calculator;
- Prepared draft benefits calculator;
- Prepared draft Stated Preference Survey Report;
- Prepared a compilation of best practices documents for impingement and entrainment (I&E) sampling design and a set of links to multiple data sources for permit writers for incorporation into the online 316(b) implementation user guide.

The tasks, estimated LOE, deliverables and schedule for each task are described below.

VII. General Requirements of the Work Assignment and Schedule

Confidential Business Information: During the course of the work assignment, the contractor will be accessing and evaluating CBI. As such, the contractor shall adhere to EPA's CBI policy and other procedures as described in the contract clauses (Clauses H.15-H19 and H.21). The contractor must maintain CBI security clearance to use CBI information. The contractor shall not disclose any CBI to anyone other than EPA without prior written approval from the EPA

WACOR. The contractor shall, at all times, adhere to Confidential Business Information (CBI) procedures when handling industry information. The contractor shall manage all reports, documents, and other materials and all draft documents developed under this work assignment in accordance with the procedures set forth in our "Office of Science and Technology Confidential Business Information Application Security Plan" (August 2011) or its successor approved plans.

Budget Reporting: The contractor under this work assignment is required to report to the EPA WACOR when 75 percent of the total work assignment funding amount has been depleted. The contractor must also report to the EPA WACOR when 75 percent of the approved work plan budget has been depleted.

Identification as Contracting Staff: To avoid the perception that contractor personnel are EPA employees, contractor personnel shall be identified clearly as independent contractors of EPA when participating in events with outside parties and prior to the start of any meeting. Contractor personnel are prohibited from acting as the Agency's official representative. When speaking with the public, the contractor should refer all interpretations of policy to the EPA.

Limitation of Contractor Activities: The contractor shall submit drafts of all deliverables to the EPA WACOR for review prior to submission of the final product. These drafts will clearly specify the methods, procedures, considerations, assumptions, relevant citations, data sources and data that support any conclusions and recommendations. The contractor shall incorporate all EPA WACOR comments into all final deliverables, unless otherwise agreed upon by the EPA WACOR.

Quick Response: Under this Performance Work Statement, the contractor may be required to provide information for use by EPA for quick responses and analyses of options, issues, and policy decisions. Quick responses are those which require completion in one to five working calendar days.

Travel: EPA does anticipate the need for non-local travel by contractor employees and/or subcontractors to support the scope of this work assignment.

Deliverable Formatting: All memos, draft comments, summaries and responses, and chapters are to be provided in hard copy and in electronic form using Word and/or Excel/Access, ArcView, or, in special cases, another software program agreed to in advance by EPA. Memos are to be written in a manner that will make them easy to turn into draft chapters for the Final Reports. For deliverables that are in Word or pdf versions of Word documents, and that are intended to be shared with EPA management or the public, the contractor shall use decimal align in all tables containing columns of numbers of varying digits, whether or not decimal places are reported. All final materials, e.g., memos, chapters, etc. are to be prepared only after receipt of written technical direction from the EPA WACOR.

Monthly Progress Reports: The monthly progress reports shall include reporting hours and funds spent under this WA on a task-by-task basis, including at the subtask level (e.g. Task 4.1, Task

4.2, etc.), where applicable.

VIII. Performance Work Statement

Task 1 -- Project Management

The contractor shall prepare a work plan 15 calendar days after receipt of work assignment signed by the Contracting Officer (CO). The work plan shall outline, describe and include the technical approach, resources, timeline and due dates for deliverables, a detailed cost estimate by task, and a staffing plan. The EPA WACOR, the Contract-Level Contracting Officer Representative (CL-COR), and the CO will review the work plan. However, only the CO can approve/disapprove, suggest revisions, or change the work plan. Official revisions will be given to the contractor by the CO. The contractor shall prepare a revised work plan incorporating the CO's comments, if required.

Deliverables and schedule
1. Work plan due 15 calendar days after receipt of work assignment.

A weekly update call with the EPA WACOR will be required for this work assignment to discuss progress on deliverables, costs and other potential issues.

Task 2 - Quality Assurance (QA)

2.1 Background

Quality Assurance Project Plans are required under the Agency's Quality Assurance Policy CIO-2105, formerly EPA Order 5360.1 A2 (May 2000), and implementing guidance CIO-2105-P-01-0 (May 2000). All projects that involve the generation, collection, analysis, and use of environmental data must have an approved Quality Assurance Project Plan (QAPP) in place prior to the commencement of the work. Examples of these environmental data operations are provided in Table 2.1 below.

Table 2.1. Examples of work that involves the collection, generation, evaluation, analysis, or use of environmental data

Item	Examples
Data	Includes field sampling information (sample location information, flow measurements, temperature, pH, physical observations, etc.), laboratory measurements (e.g., chemical, physical, biological, radiological measurements), data collected from questionnaires, economic data, census data, and any other types of existing data (i.e., data generated for a different purpose or generated by a different organization)
Data generation	Includes field studies, laboratory studies, and generation of modeling output

Table 2.1. Examples of work that involves the collection, generation, evaluation, analysis, or use of environmental data

Item	Examples
Data collection	Includes field surveys, questionnaire surveys, literature searches, and third party data
Data evaluation	Includes data inspection, review, assessment, and validation
Data analysis	Includes statistical, engineering, and economic analysis, and testing, evaluation, and validation of methods and models; database creation, data extraction, and data manipulation
Data Use	Any use of data to support EPA decisions, regulations, policy, publications, or tools (including effluent guidelines, 304(m) program, standards, environmental assessments, and models, tools, or reports disseminated by EPA to assist other organizations in implementing environmental programs)

Note that QAPPs are required for the development or revision of models and software that support the generation, collection, evaluation, analysis, or use of data. (A model is set of equations and assumptions used to predict unknown data.) When existing models are used as a tool to generate or evaluate data, the project QAPP must describe the model and explain how it will be used and how its output will be evaluated to ensure the modeling effort meets the overall quality objectives for the project. Development or revision of new models also must be supported by a QAPP that describes the objectives for the model, the quality criteria that will be applied to the model, and the procedures for evaluating whether the model meets those criteria.

2.2 QA Project Plan Requirements

The contractor has previously prepared a contract-wide Programmatic QAPP (PQAPP) for Contract EP-C-13-039. This PQAPP describes, in a single document, information that is not site or time-specific, but applies throughout the program (i.e., the duration of the contract). When tasked with preparing the PQAPP, the contractor was informed that the PQAPP may need to be supplemented with project-specific details to support individual work assignments that involve the collection, generation, evaluation, analysis, or use of environmental data.

The activities in this work assignment involve gathering, evaluating, analyzing, and otherwise using existing environmental data (also known as "secondary" use of data). However, EPA has determined that the contractor is operating under the existing PQAPP and that the PQAPP addresses QA requirements for this work assignment. In support of this work assignment, the contractor shall ensure that the work plan provides enough detail to clearly describe:

- Specific objectives of the project(s) supported by this work assignment, including typical questions that must be answered when the contractor is using existing sources of data to perform economic analyses in support of EPA's implementation activities under the final 316(b) rule;
- The type of data to be gathered or used under this work assignment to support the project objectives—including data from search engines, federal databases, EPA data bases—as

well as a rationale for when those databases are appropriate and what data available in each will support the project;
- The quality objectives needed to ensure the data will support the project objectives; and,
- The Quality Assurance/Quality Control (QA/QC) activities to be performed to ensure that any results obtained are documented and are of the type, quality, transparency, and reproducibility needed.

Table 1 in the Appendix at the end of this WA contains the EAD Checklist for this project, which utilizes existing data. The table demonstrates how the PQAPP addresses QA requirements for this work assignment. The contractor shall use the same PQAPP tables issued in the previous WA 2-04. The contractor shall update, if necessary, and fill in staff roles in the table in the 'explanatory comments' under A.4 and make any additional detailed notes in the explanatory comments column if details of the previous table has changed. The contractor shall then include the completed table as a separate Appendix A to the work plan upon submittal to EPA. This Appendix A should be a stand-alone document if QA documentation is requested. Therefore, the table title must include the title of the WA, WA number, and contract number. The WACOR has provided this information in the title, which the contractor may use to fulfill this requirement.

2.3 Additional QA Documentation Required

The EPA Quality Manual for Environmental Programs (CIO 2105-P-01-0, May 2000) requires published Agency reports containing environmental data to be accompanied by a readily identifiable section or appendix that discusses the quality of the data and any limitations on the use of the data with respect to their originally intended application. The EPA Quality Manual further requires Agency reports to be reviewed by the QA manager (or other authorized official) before publication to ensure that an adequate discussion of QA and QC activities is included. The purpose of the review is to ensure that the reports provide enough information to enable a knowledgeable reader to determine whether the technical and quality goals were met for the intended use of the data. Reports should include applicable statements regarding the use of any environmental data presented as a caution about possible misuse of the data for other purposes. For example, a Technical Support Document or Study Report must include a clear discussion of the quality management strategies (including the project goals and objectives, quality objectives and criteria, and QA/QC practices) that were employed to control and document the quality of data generated and used. These documents should also discuss any deviations from procedures documented in the EPA-approved QAPP(s) supporting the project, the reasons for those deviations, any impact of those deviations had on data quality, and steps taken to mitigate data quality issues.

In support of this Agency requirement, all major deliverables (e.g., Technical Support Documents, Study Reports, Analytical Methods) produced by the contractor under this work assignment must include a discussion of the QA/QC activities that were performed to support the deliverable. This discussion must provide a sufficient level of detail to allow the EAD QA Coordinator (or designee) to determine whether the QA/QC strategies implemented for the project sufficiently support the intended use of the data. Upon receipt, the EPA WACOR will review each applicable report and

certify whether the contractor has adhered to the QA requirements documented in the contractor's PQAPP.

The contractor also shall provide EPA with monthly reports of QA activities performed during implementation of this work assignment. These monthly QA reports shall identify QA activities performed to support implementation of this work assignment, problems encountered, deviations from the QAPP, and corrective actions taken. If desired, the contractor may include this report as a part of the contract-required monthly financial/technical progress report.

2.4 Data Quality Act/Information Quality Guidelines Requirements

The Data Quality Act (also known as the Information Quality Act) requires EPA to ensure that influential information disseminated by the Agency is sufficiently transparent in terms of data and methods of analysis so that the information is capable of being substantially reproduced. To support compliance with these data transparency/data reproducibility requirements, EPA plans to include QAPPs as part of any rulemaking record documentation to be made available to the public. (This includes PQAPPs and Supplemental QAPPs (SQAPPs.)) The contractor may claim information in QAPPs as confidential; if the contractor chooses to do so, the contractor shall submit a sanitized (i.e., public) version and an unsanitized (i.e., confidential) version at the time the QAPP is submitted for approval by EPA. The sanitized version shall be included in the public docket for the applicable rulemaking (or other docket record), and the unsanitized version shall be included in a non-public (i.e., confidential) portion of the docket (or record).

Information contained in the approved QAPP shall be transparent and reproducible and meet the requirements of the Data Quality Act for influential information. EPA's *Guidelines for Ensuring and Maximizing the Quality, Objectivity, Utility, and Integrity, of Information Disseminated by the Environmental Protection Agency* (EPA/260R-02-008, October 2002), referred to as "EPA's Information Quality Guidelines," describe EPA procedures for meeting Data Quality Act requirements. Section 6.3 of EPA's Information Quality Guidelines indicate that "especially rigorous robustness checks" should be applied in circumstances where quality-related information cannot be disclosed due to confidentiality issues. Where applicable, the contractor should indicate which results were obtained using the tools (Standard Operating Procedures (SOPs), checklists, and guidelines) that the contractor designates as confidential so that the EPA WACOR can easily identify the areas that require rigorous robustness checks and document that those checks have been performed. At the discretion of the EPA WACOR, the contractor may be requested to prepare pre-dissemination review checklist as described in Section 5.5 of the Office of Water Quality Management Plan, February 2009. If this is required, the EPA WACOR will notify the contractor through written technical direction.

Deliverables and schedule

1. Monthly reports of QA work performed (may be included in contractor's monthly progress report) due monthly throughout the WA period of performance.

Task 3 - Adherence to the Standardized Naming Convention and Version Control

The contractor shall adhere to the EPA WACOR approved standardized naming convention and version control (SNCVC) plan which was developed under the Construction and Development WA 0-01 of Contract EP-C-07-023 (WA0-01_T1_SNCVC_08.31.07_V1.pdf). The contractor shall use this standardized convention for all deliverables associated with this work assignment.

Task 4 -- Economics Support for Cost-related 316(b) Implementation Activities

Under this task, the contractor shall provide analytical and technical economics support to EPA for a variety of cost-related 316(b) implementation activities. Examples of these activities include completion of the cost calculator, including user instructions (also called documentation); technical support to develop responses to cost-related questions in EPA's 316(b) implementation Questions & Answers (Q&A) database for permit writers and facilities; and, technical support for implementation – other activities, including testing, outreach, and training in the use of the cost calculator for EPA regions, states and facilities. **This task is a continuation of work in the previous WA (2-04).**

Deliverables and Schedule

4.1a. Final draft cost calculator is due by December 1, 2016, including all draft final documentation. The EPA WACOR will provide written comments on the calculator and draft final documentation.

4.1b. Revised drafts finals are due three weeks after receipt of comments from the EPA WACOR.

4.1c. Final working version of the complete calculator and revised documentation are due after receipt of final comments from the EPA WACOR, but no later than July 31, 2017.

4.2. Technical Support for Implementation – Other Activities (Continued from previous WA)

The contractor shall provide additional cost-related technical support for implementation of the 316(b) rule. The EPA WACOR expects this technical support to fall under three general categories:

4.2.a. Responding to management questions about cost-related implementation issues and preparing briefing and meeting materials which may include, but not be limited to, short briefing documents and PowerPoint presentations. The contractor may also be requested to review analyses conducted by EPA and its contractors, and provide technical review of materials prepared by Agency staff. Examples of deliverables include developing quick turnaround analyses, preparing webinar materials for webinars with permit writers and/or facilities, and developing briefing materials on cost-related issues.

4.2.b.Testing, outreach and training activities using the cost calculator for various audiences, including EPA headquarters and regional staff, State Clean Water Agencies, stakeholders from industry and environmental organizations, and the regulated facilities. Examples of deliverables include outreach and training materials for the calculator, including webinars and tutorials on the use of the calculators.

4.2.c..Prepare responses to economics-related questions from permit writers, facilities, and other stakeholders for the Q&A database which EPA is developing with support from TetraTech, under WA 4-19 of EP-C-11-009. The Q&A database responses may take the form of a brief response of less than one page or may take the form of essays or analyses, no longer than three pages, that give a conceptual background on the issues, describe the methodology for calculations and estimates, and outline the key points from the analyses and their role in permit writers' decisions.

Deliverables and Schedule

4.2a. Draft deliverables are due two weeks after receipt of technical direction from the EPA WACOR. The EPA WACOR will provide written comments. Draft quick turnaround deliverables are due one week after requested by technical direction from the EPA WACOR.
4.2b. Final deliverables incorporating comments from the EPA WACOR are due two weeks after receipt of comments from the EPA WACOR, but no later than July 31, 2017. Final quick turnaround deliverables are due one week after receipt of comments from the EPA WACOR but no later than July 31, 2017.

Task 5 – Technical Support for Benefits-Related Implementation Activities

Under this task, the contractor shall provide analytical and technical economics support to EPA for a variety of 316(b) implementation activities related to benefits issues. Examples of these activities include completion of the benefits calculator, including user instructions (also called documentation); and, technical support for implementation – other activities, including technical support to develop responses to benefits-related questions for EPA's 316(b) implementation Q&A database for permit writers and facilities; and testing, outreach, and training in the use of the benefits calculator for EPA Regions, States and facilities. **This task is a continuation of the previous work in WA 2-04.**

Deliverables and Schedule

5.1a. Draft final benefits calculator is due December 1, 2016, including draft final documentation. The EPA WACOR will provide written comments on the calculator and documentation.
5.1b. Revised drafts are due three weeks after receipt of the comments. EPA expects to provide a second round of comments, with final draft versions due two weeks after receipt of comments.
5.1c. Final working version of the complete calculator and revised documentation are due one month after receipt of final comments from the EPA WACOR, but no later than July 31, 2017.

5.2. Technical Support for Implementation – Other Activities (Continuation of Previous WA)

The contractor shall provide additional benefits-related technical support for implementation of the 316(b) rule. The EPA WACOR expects this technical support to fall under three general categories:

5.2a. Responding to management questions about benefits-related implementation issues and preparing briefing and meeting materials which may include, but not be limited to, short briefing documents and PowerPoint presentations. The contractor may also be requested to review analyses conducted by EPA and its contractors, and provide technical review of materials prepared by Agency staff. Examples of deliverables include developing quick turnaround analyses, preparing webinar materials for webinars with permit writers and/or facilities, and developing briefing materials on cost-related issues.

5.2b.Testing, outreach and training activities using the benefits calculator for various audiences, including EPA headquarters and regional staff, State Clean Water Agencies, stakeholders from industry and environmental organizations, and the regulated facilities. Examples of deliverables include outreach and training materials for the calculator, including webinars and tutorials on the use of the calculators.

5.3c. Prepare responses to benefits-related questions from permit writers, facilities, and other stakeholders for the Q&A database which EPA is developing with support from Tetra Tech, under WA 4-19 of EP-C-11-009. The Q&A database responses may take the form of a brief response of less than one page or may take the form of essays or analyses, no longer than three pages, that give a conceptual background on the issues, describe the methodology for calculations and estimates, and outline the key points from the analyses and their role in permit writers' decisions.

Deliverables and Schedule

5.2a. Draft deliverables are due two weeks after receipt of technical direction from the EPA WACOR. The EPA WACOR will provide written comments. Quick turnaround deliverables are due one week after requested by technical direction from the EPA WACOR.

5.2b. Final deliverables incorporating comments from the EPA WACOR are due two weeks after receipt of comments from the EPA WACOR, but no later than July 31, 2017. Final quick turnaround deliverables are due one week after receipt of comments from the EPA WACOR but no later than July 31, 2017.

SCHEDULE OF DELIVERABLES

Task	Deliverable	Delivery Schedule
Task 1 – Prepare Work Plan		
1	Prepare work plan	Due 15 calendar days after WA receipt.
Task 2 -- Adherence to the Quality Assurance Project Plan		
2	Monthly reports of QA work performed	May be included in monthly progress reports.
Task 3 -- Adherence to the Standardized Naming Convention and Version Control (SNCVC)		
		No deliverable for this task.

Task 4 – Economics Support for Cost-related 16(b) Implementation Activities		
4.1a	Final draft cost calculator, including draft documentation.	December 1, 2016.
4.1b	Final cost calculator and documentation.	Due three weeks after receipt of comments from EPA WACOR. Revised final versions are due two weeks after second set of comments from the WACOR (if provided), but no later than July 31, 2017.
4.1c	Final working version of the complete calculator and revised documentation	Due one month after receipt of final comments from the EPA WACOR, but no later than July 31, 2017.
4.2a	Final technical support deliverables for implementation activities	Due two weeks after receipt of technical direction from the EPA WACOR. Quick turnaround deliverables are due one week after requested by technical direction from the EPA WACOR.
4.2b	Final technical support deliverables incorporating comments from the EPA WACOR	Due two weeks after receipt of comments from the EPA WACOR. Quick turnaround deliverables are due one week after receipt of comments from the EPA WACOR.
Task 5 – Technical Support for Benefits-Related Implementation Activities		
5.1a	Final draft benefits calculator, including draft documentation.	Due one month after receipt of final comments from the EPA WACOR, but no later than July 31, 2017.
5.1b	Final benefits calculator and documentation.	Due three weeks after receipt of comments from EPA WACOR. Revised final versions are due two weeks after second set of comments from the WACOR (if provided) but no later than July 31, 2017.
5.1c	Final working version of the complete calculator and revised documentation	Due one month after receipt of final comments from the EPA WACOR, but no later than July 31, 2017.
5.2a	Final technical support deliverables for implementation activities	Draft deliverables are due two weeks after receipt of written technical direction from the EPA WACOR. Quick turnaround deliverables are due one week after receipt of technical direction from the EPA WACOR.
5.2b	Final technical support deliverables for implementation activities	Final deliverables are due two weeks after receipt of comments from the EPA, but no later than July 31, 2017. Quick turnaround deliverables are due one week after receipt of comments from the EPA WACOR, but no later than July 31, 2017.

Appendix
EAD Checklist for WA 3-04, Implementation and Benefits Activities for the 316(b) Existing Facilities Rule, Contract EP-C-13-039

The items noted in this checklist are adapted from those elements found in *EPA Requirements for QA Project Plans (QA/R-5)* (EPA, 2001a), but tailored to the use of existing data.

Table 1. EAD Checklist for WA 3-04 Utilizing Existing Data

QAPP Element	A = Applicable N/A = Not applicable		Covered in PQAPP?	Covered in SQAPP?	Ac = Acceptable NAc = Not Acceptable		Comments
	A	N/A			Ac	NAc	
Title & Approval Sheet							
Project title	X		X				See Checklist for WA 1-04, Implementat and Benefits Activities for the 316(b) Ex ing Facilities Rule, Contract EP-C-13-03
Organization's name	X		X				See above
Effective date and/or version identifier	X		X				See above
Dated signature of Organization's project manager	X		X				See above
Dated signature of Organization's QA manager	X		X				See above
Other signatures, as needed (e.g., EAD Project Officer, EAD QA Coordinator)	X		X				See above
Revision History	X		X				See above
Table of Contents							
Includes sections, figures, tables, references, and appendices	X		X				See Checklist for WA 1-04, Implementat and Benefits Activities for the 316(b) Ex ing Facilities Rule, Contract EP-C-13-03
Document control information indicated (when required by the EPA Project Manager and QA Manager)		X					See above
Distribution List							
Includes all individuals who are to implement or otherwise receive the QAPP and identifies their organization	X		X				See Checklist for WA 1-04, Implementat and Benefits Activities for the 316(b) Ex ing Facilities Rule, Contract EP-C-13-03
Project/Task Organization							
Identifies key individuals with their responsibilities (e.g., data users, decision makers, project QA manager, Subcontractors, etc.) and contact info.	X		X				PQA _____ Completed Checklist attached to work pl
Organization chart shows lines of authority & reporting responsibilities	X		X				See Checklist for WA 1-04, Implementat and Benefits Activities for the 316(b) Ex ing Facilities Rule, Contract EP-C-13-03
Project QA manager position indicates independence from unit collecting/using data	X		X				See above
Problem Definition/Background							
Clearly states problem to be resolved, decision to be made, or hypothesis to be tested	X		X				See Checklist for WA 1-04, Implementat and Benefits Activities for the 316(b) Ex ing Facilities Rule, Contract EP-C-13-03

QAPP Element	A = Applicable N/A = Not applicable		Covered in PQAPP?	Covered in SQAPP?	Ac = Acceptable NAc = Not Acceptable		Comments
	A	N/A			Ac	NAc	
Identifies project objectives or goals	X		X				See above
Historical & background information		X					See above
Cites applicable technical, regulatory, or program-specific quality standards, criteria, or objectives	X		X				See above
Project/Task Description							
List measurements to be made/data to obtain	X		X				See Checklist for WA 1-04, Implementat and Benefits Activities for the 316(b) Ex ing Facilities Rule, Contract EP-C-13-03
Notes special personnel or equipment requirements		X					See above
Provides work schedule		X					See above
Overall Quality Objectives & Criteria							
States overall quality objectives and limits needed to support the project goals and objectives cited in Element A5.	X		X				See Checklist for WA 1-04, Implementat and Benefits Activities for the 316(b) Ex ing Facilities Rule, Contract EP-C-13-03
Special Training Requirements/ Certifications							
Identifies specialized skills, training or certification requirements	X		X				See Checklist for WA 1-04, Implementat and Benefits Activities for the 316(b) Ex ing Facilities Rule, Contract EP-C-13-03
Discusses how this training will be provided/the necessary skills will be assured and documented	X		X				See above
Project-level Documents & Records							
Describes process for distributing the approved QAPP and other planning documents (and updates) to staff	X		X				See Checklist for WA 1-04, Implementat and Benefits Activities for the 316(b) Ex ing Facilities Rule, Contract EP-C-13-03
Identifies final work products that will result from the project	X		X				See above
Describes the process for developing, reviewing, approving, and disseminating the final work products and individuals responsible for these processes	X		X				See above
. Data Needs							
Detailed list/description of the specific data elements needed to support project goals	X		X				See Checklist for WA 1-04, Implementation and Benefits Activities the 316(b) Existing Facilities Rule, Contract EP-C-13-039
Description of the scope of the data elements that you need (e.g., data supporting specific treatment options vs. the full range of options, data supporting the entire country vs. a specific geographic region)	X		X				See above
If project includes development or update of a project database, QAPP identifies and defines each database field		X					See above

QAPP Element	A = Applicable N/A = Not applicable		Covered in PQAPP?	Covered in SQAPP?	Ac = Acceptable NAc = Not Acceptable		Comments
	A	N/A			Ac	NAc	
. Potential Data Sources							
Identifies and describes potential sources of the existing data needed (e.g., photographs, topographical maps, facility or state files, census data, meteorological data, publications, etc.) and the rationale for their use	X		X				See Checklist for WA 1-04, Implementation and Benefits Activities the 316(b) Existing Facilities Rule, Contract EP-C-13-039
If literature searches are used, describes the search engines that will be used and key search terms	X		X				See above
If databases or models will be used, describe the database (or model) in terms of who developed it and operates it and the type of data it contains	X		X				See above
For other potential sources, describe the potential sources and rationale for considering or using each one	X		X				See above
. Criteria for Selecting Data Sources							
Identifies each criterion that will be used to determine if the candidate data sources listed in B2 will meet your needs, and how each criterion is defined. (Criteria vary by project; examples include reliability, age, applicability, quantity, format, and others)	X		X				See Checklist for WA 1-04, Implementation and Benefits Activities the 316(b) Existing Facilities Rule, Contract EP-C-13-039
Explains rating system used to evaluate source against each criterion	X		X				See above
. Data Value Selection Approach							
For data sources that meet the criteria identified in B3: Describes the criteria and procedures that will be used to determine which value(s) identified in the acceptable sources are most appropriate for use in the project	X		X				See Checklist for WA 1-04, Implementation and Benefits Activities the 316(b) Existing Facilities Rule, Contract EP-C-13-039
For data that do not meet these pre-established criteria but are the only data available, explains how the decision to use such data will be made and documented	X		X				See above
. Resolving Data Gaps							
Describes the process for identifying and addressing data gaps that still exist after candidate data sources have been evaluated and appropriate data values have been identified	X		X				See Checklist for WA 1-04, Implementation and Benefits Activities the 316(b) Existing Facilities Rule, Contract EP-C-13-039
Describes the process that will be used to address any new data needs revealed during the data gathering process (i.e., additional data elements not previously considered)	X						See above

QAPP Element	A = Applicable N/A = Not applicable		Covered in PQAPP?	Covered in SQAPP?	Ac = Acceptable NAc = Not Acceptable		Comments
	A	N/A			Ac	NAc	
. Data Gathering Documentation and Records							
Describes how results of the source selection and the data value selection will be documented, including any sources or values that were rejected and the rationale for not using them	X		X				See above
For data that are deemed acceptable and that will be used, explains how each data element will be associated to its original source citation (i.e., bibliographic information, telephone contact reports, email messages, etc.)	X		X				See above

QAPP Element	A = Applicable N/A = Not applicable		Covered in PQAPP?	Covered in SQAPP?	Ac = Acceptable NAc = Not Acceptable		Comments
	A	N/A			Ac	NAc	
. Standardization of Data Elements							
Describes the process to ensure that units and other key measures are captured and standardized (or otherwise made comparable) in the database	X		X				See Checklist for WA 1-04, Implementation and Benefits Activities the 316(b) Existing Facilities Rule, Contract EP-C-13-039
If the project requires that all fields be standardized to a single set of units (e.g., US dollars for economic data, ug/L for chemical data), identifies the standard units that will be required for each data element	X		X				See above
Identifies the procedures for converting data reported in other units to the standardized units, including any rounding or truncating procedures, and procedures for ensuring these conversions are performed correctly	X		X				See above
If standardization of data elements is not needed, explains the process for ensuring that data presented in varying units are comparable enough for use in the project and that project staff members and other data users will be able to readily identify differences in units	X		X				See above
. Data Entry							
Explains the process for manually entering selected data into the project database, who will be responsible for such data entry, and the QC strategies that will be used to ensure that the database accurately and completely captures the data as presented in the original source	X		X				See Checklist for WA 1-04, Implementation and Benefits Activities the 316(b) Existing Facilities Rule, Contract EP-C-13-039
. Merging or Uploading Electronic Data from Existing Sources							
If data are available electronically and will be uploaded or merged into the project database: describes the procedures that will be followed to ensure that errors are not introduced during the upload/merge process and that the final database reflects the original dataset(s)	X		X				See Checklist for WA 1-04, Implementation and Benefits Activities the 316(b) Existing Facilities Rule, Contract EP-C-13-039
. Data Review							
Describes the process for ensuring that the data have been recorded, transmitted, and processed correctly	X		X				See Checklist for WA 1-04, Implementation and Benefits Activities the 316(b) Existing Facilities Rule, Contract EP-C-13-039
. Data Storage and Manipulation							
Describes how the existing data will be stored	X		X				See Checklist for WA 1-04, Implementation and Benefits Activities the 316(b) Existing Facilities Rule, Contract EP-C-13-039

QAPP Element	A = Applicable N/A = Not applicable		Covered in PQAPP?	Covered in SQAPP?	Ac = Acceptable NAc = Not Acceptable		Comments
	A	N/A			Ac	NAc	
Describes who will be responsible for access to and maintenance of the stored data	X		X				See above
Describes how the existing data will be incorporated with other project data to support the project goal/decision to be made	X		X				See above
Describes the QC strategies that will be employed to ensure that the integrity of the data is not compromised during data storage, access/retrieval, updates, or other manipulation	X		X				See above

QAPP Element	A = Applicable N/A = Not applicable		Covered in PQAPP?	Covered in SQAPP?	Ac = Acceptable NAc = Not Acceptable		Comments
	A	N/A			Ac	NAc	
. Data Quality Verification and Data Quality Reporting							
Describes the process for verifying that the final set of data meets the overall criteria originally specified for the project	X		X				See Checklist for WA 1-04, Implementation and Benefits Activities the 316(b) Existing Facilities Rule, Contract EP-C-13-039
Describes how these determinations will be documented and reported.	X		X				See above
For data that don't meet the pre-established specifications, explains the process for determining if they are usable and how such decisions will be documented	X		X				See above
. Use/Analysis of the Existing Data							
Provides details regarding the exact means in which the data will be used to meet project objectives	X		X				See Checklist for WA 1-04, Implementation and Benefits Activities the 316(b) Existing Facilities Rule, Contract EP-C-13-039
Includes an explanation or list of the information to be calculated and the data elements that will be used to make those calculations	X		X				See above
Includes applicable calculations and equations (if known) or explanations of how they will be developed.	X		X				See above
Includes plans for excluding outliers.	X		X				See above
. Methodology Documentation and Conceptual Review							
If exact methodologies for analyzing the data will need to be developed or modified during the course of data analysis, explains the process by which such methodologies will be documented, who is responsible for reviewing/ approving their use, and how the methodologies will be checked to ensure they yield the desired products	X		X				See Checklist for WA 1-04, Implementation and Benefits Activities the 316(b) Existing Facilities Rule, Contract EP-C-13-039

QAPP Element	A = Applicable N/A = Not applicable		Covered in PQAPP?	Covered in SQAPP?	Ac = Acceptable NAc = Not Acceptable		Comments
	A	N/A			Ac	NAc	
. Technical Review of the Data Analysis							
Describes activities that will be used to ensure the data analyses are being implemented as specified and will support project objectives	X		X				See Checklist for WA 1-04, Implementation and Benefits Activities the 316(b) Existing Facilities Rule, Contract EP-C-13-039
Explains procedures for identifying and notifying appropriate personnel if changes to the originally planned procedures are warranted, and the process for approving, documenting and implementing such changes	X		X				See above
. Final Verification of Data Analysis and Reconciliation with User Requirements							
Describes the process for reviewing the final work product to ensure that the work was generated in accordance with the QAPP, and that the work product addresses the overall project goals and objectives	X		X				See Checklist for WA 1-04, Implementation and Benefits Activities the 316(b) Existing Facilities Rule, Contract EP-C-13-039
Describes how the results of this assessment will be documented	X		X				See above
Describes how any limitations of the data or data analyses that were used to prepare the final work product will be documented and communicated	X		X				See above

EPA

United States Environmental Protection Agency
Washington, DC 20460

Work Assignment

Work Assignment Number: 3-04

☐ Other ☐ Amendment Number:

Contract Number	Contract Period	Title of Work Assignment/SF Site Name
EP-C-13-039	09/11/2013 To 07/31/2017 Base Option Period Number 3	316b Benefits Activites

Contractor: ABT ASSOCIATES INC.

Specify Section and paragraph of Contract SOW: A1

Purpose:
- [X] Work Assignment
- [ ] Work Assignment Amendment
- [X] Work Plan Approval
- [ ] Work Assignment Close-Out
- [ ] Incremental Funding

Period of Performance: From 08/01/2016 To 07/31/2017

Comments:

☐ Superfund — Accounting and Appropriations Data — [X] Non-Superfund

SFO (*Max 2*): ☐

Note: To report additional accounting and appropriations date use EPA Form 1900-69A.

Line	DCN (Max 6)	Budget/FY (Max 4)	Appropriation Code (Max 6)	Budget Org/Code (Max 7)	Program Element (Max 9)	Object Class (Max 4)	Amount (Dollars)	(Cents)	Site/Project (Max 8)	Cost Org/Code
1										
2										
3										
4										
5										

Authorized Work Assignment Ceiling

	Cost/Fee	LOE
Contract Period: 09/11/2013 To 07/31/2017	$0.00	0
This Action:	$145,911.00	1,060
Total:	$145,911.00	1,060

Work Plan / Cost Estimate Approvals

	Cost/Fee	LOE
Contractor WP Dated: 08/17/2016	$145,911.00	1,060
Cumulative Approved:	$145,911.00	1,060

Work Assignment Manager Name: James Covington	Branch/Mail Code:
(Signature) (Date)	Phone Number: 202-566-1034
	FAX Number:
Project Officer Name: Ahmar Siddiqui	Branch/Mail Code:
(Signature) (Date)	Phone Number: 202-566-1044
	FAX Number:
Other Agency Official Name	Branch/Mail Code:
(Signature) (Date)	Phone Number:
	FAX Number:
Contracting Official Name: Tammy Adams TAMMY ADAMS (Signature)	Digitally signed by TAMMY ADAMS DN: c=US, o=U.S. Government, ou=USEPA, ou=Staff, cn=TAMMY ADAMS, dnQualifier=0000018417 Date: 2016.08.23 13:16:42 -04'00' (Date)
	Branch/Mail Code:
	Phone Number: 513-487-2030
	FAX Number: 513-487-2545

EPA

United States Environmental Protection Agency
Washington, DC 20460

Work Assignment

Work Assignment Number: 3-05

☐ Other ☐ Amendment Number:

Contract Number	Contract Period	Title of Work Assignment/SF Site Name
EP-C-13-039	09/11/2013 To 07/31/2017 Base Option Period Number 3	Steam Econ and Litigation supp

Contractor	Specify Section and paragraph of Contract SOW
ABT ASSOCIATES INC.	A-2

Purpose:
- [X] Work Assignment
- [ ] Work Assignment Amendment
- [ ] Work Plan Approval
- [ ] Work Assignment Close-Out
- [ ] Incremental Funding

Period of Performance: From 08/01/2016 To 07/31/2017

Comments:
Performance on this Work Assignment shall not begin until August 1, 2016.

☐ Superfund — Accounting and Appropriations Data — [X] Non-Superfund

Note: To report additional accounting and appropriations date use EPA Form 1900-69A.

SFO (*Max 2*) ☐

Line	DCN (Max 6)	Budget/FY (Max 4)	Appropriation Code (Max 6)	Budget Org/Code (Max 7)	Program Element (Max 9)	Object Class (Max 4)	Amount (Dollars)	(Cents)	Site/Project (Max 8)	Cost Org/Code
1										
2										
3										
4										
5										

Authorized Work Assignment Ceiling

Contract Period:	Cost/Fee:	LOE:
09/11/2013 To 07/31/2017		0
This Action:		300
Total:		300

Work Plan / Cost Estimate Approvals

Contractor WP Dated:	Cost/Fee	LOE:
Cumulative Approved:	Cost/Fee	LOE:

Work Assignment Manager Name: James Covington	Branch/Mail Code:
(Signature) (Date)	Phone Number: 202-566-1034
	FAX Number:
Project Officer Name: Ahmar Siddiqui	Branch/Mail Code:
(Signature) (Date)	Phone Number: 202-566-1044
	FAX Number:
Other Agency Official Name	Branch/Mail Code:
(Signature) (Date)	Phone Number:
	FAX Number:
Contracting Official Name: Tammy Adams	Branch/Mail Code:
TAMMY ADAMS Digitally signed by TAMMY ADAMS DN: c=US, o=U.S. Government, ou=USEPA, ou=Staff, cn=TAMMY ADAMS, dnQualifier=0000018417 Date: 2016.07.28 17:00:48 -04'00'	Phone Number: 513-487-2030
(Signature) (Date)	FAX Number: 513-487-2545

WORK ASSIGNMENT

I. Title: Steam Electric Economic and Litigation Support.

Contractor: Abt Associates **Contract No.:** EP-C-13-039

II. Work Assignment Number: 3-05

III. Estimated Period of Performance: August 1, 2016 through July 31, 2017

IV. Estimated Level of Effort: 300

V. Key EPA Personnel:

Work Assignment Contracting Officer Representative (WACOR):
James C. Covington, III
OST/EAD (4303T)
202/566-1034
202/566-1053 (fax)

VI. Background and Purpose:

The 1972 Clean Water Act (CWA) directs the Environmental Protection Agency (EPA) to develop national technology-based regulations for categories of industries that discharge pollutants directly to surface waters (effluent guidelines) or that discharge pollutants indirectly through sewage treatment plants (pretreatment standards). The CWA also directs EPA to develop national technology-based regulations for new industrial facilities (new source performance standards).

Under Executive Orders 12866 and 13563, EPA is required to estimate the potential benefits and costs to society. As such, the purpose of this Work Assignment (WA) is to support the Steam Electric project with litigation and economic support.

Under this work assignment the contractor shall conduct all analyses requiring the collection and manipulation of data and models in accordance with the EPA approved quality assurance (QA) project plan was developed for this work. The QA project plan shall describe the procedures for assuring the quality of the primary and secondary economic data used for this work assignment.

In carrying out the tasks specified in this work assignment, the contractor may be called upon to build upon and continue work performed under this Contract, EP-C-13-039. The work performed under this work assignment shall not duplicate work conducted under the previous work assignments. **This work assignment is a continuation of the previous WA (2-05).**

VII. General Requirements of the Work Assignment and Schedule

Confidential Business Information: During the course of the work assignment, the contractor will be accessing and evaluating CBI. As such, the contractor shall adhere to EPA's CBI policy and other procedures as described in the contract clauses (Clauses H.15-H19 and H.21). The contractor must maintain CBI security clearance to use CBI information. The contractor will not disclose any CBI to anyone other than EPA without prior written approval from the EPA WACOR. The contractor shall, at all times, adhere to Confidential Business Information (CBI) procedures when handling industry information. The contractor will manage all reports, documents, and other materials and all draft documents developed under this work assignment in accordance with the procedures set forth in our "Office of Science and Technology Confidential Business Information Application Security Plan" (August 2011) or its successor approved plans.

Budget Reporting: The contractor under this work assignment is required to report to the EPA WACOR and Contract-Level Contracting Representative (CL-COR) when 75 percent of the total work assignment funding amount has been depleted. The contractor must also report to the EPA WACOR when 75 percent of the approved work plan budget has been depleted.

Identification as Contracting Staff: To avoid the perception that contractor personnel are EPA employees, contractor personnel shall be clearly identified as independent contractors of EPA when participating in events with outside parties and prior to the start of any meeting. Contractor personnel are prohibited from acting as the Agency's official representative. When speaking with the public, the contractor should refer all interpretations of policy to the EPA WACOR.

Limitation of Contractor Activities: The contractor shall submit drafts of all deliverables to the EPA WACOR for review prior to submission of the final product. These drafts will clearly specify the methods, procedures, considerations, assumptions, relevant citations, data sources and data that support any conclusions and recommendations. The contractor shall incorporate all EPA WACOR comments into all final deliverables, unless otherwise agreed upon by the EPA WACOR. The contractor shall adhere to all applicable EPA management control procedures as implemented by the EPA Contracting Officer (CO), EPA CL-COR, and EPA WACOR.

Quick Response: Under this Performance Work Statement the contractor may be required to provide information for use by EPA for quick responses and analyses of options, issues, and policy decisions. Quick responses are those which require completion in one to five working days.

Travel:
EPA does not anticipate the need for non-local travel by contractor employees and/or subcontractors to support the scope of this work assignment.

Deliverable Formatting: All memos, draft comments, summaries and responses, and chapters are to be provided in electronic form using Word and/or Excel/Access, ArcView, or, in special cases another software program agreed to by EPA. Memos are to be written in a manner which will make them easy to turn into draft chapters for the Final Report. For deliverables that are in Word

or pdf versions of Word documents, that are intended to be shared with management or the public, the contractor shall use decimal align in all tables containing columns of numbers of varying digits, whether decimal places are reported or not. All final materials, e.g., memos, chapters, etc. are to be prepared only after receiving written technical direction from the EPA WACOR and will be formatted to be in compliance with the Section 508 Amendment to the Rehabilitation Act of 1973.

VIII. Performance Work Statement

The EPA WACOR will review all deliverables in draft form and provide revisions and/or comments to the contractor. The contractor shall prepare the final deliverables incorporating the EPA WACOR's comments.

Task 1 - Prepare Work Plan

The contractor shall prepare a work plan within 15 calendar days after receipt of work assignment signed by the Contracting Officer (CO). The work plan shall outline, describe and include the technical approach, resources, timeline and due dates for deliverables, a detailed cost estimate by task, and a staffing plan. The EPA WACOR, the CL-COR and the CO will review the work plan. However, only the CO can approve/disapprove, suggest revisions, or change the work plan. Official revisions will be given to the contractor by the CO. The contractor shall prepare a revised work plan incorporating the CO's comments, if required.

Deliverables and schedule under Task 1

1a. Workplan within 15 calendar days of receipt of work assignment.

Task 2 - Quality Assurance

Quality Assurance Project Plans are required under the Agency's Quality Assurance Policy CIO-2105, formerly EPA Order 5360.1 A2 and implementing guidance CIO-2105-P-01-0. All projects that involve the generation, collection, analysis, and use of environmental data must have an approved Quality Assurance Project Plan (QAPP) in place prior to the commencement of the work. Examples of these environmental data operations are provided in **Table 2-1** below.

Table 2-1. Examples of work that involves the collection, generation, evaluation, analysis, or use of environmental data

Item	Examples
Data	Includes field sampling information (sample location information, flow measurements, temperature, pH, physical observations, etc.), laboratory measurements (e.g., chemical, physical, biological, radiological measurements), data collected from questionnaires, economic data, census data, and any other types of existing data (i.e., data generated for a different purpose or generated by a different organization)
Data generation	Includes field studies, laboratory studies, and generation of modeling output
Data collection	Includes field surveys, questionnaire surveys, literature searches, and third party data
Data evaluation	Includes data inspection, review, assessment, and validation
Data analysis	Includes statistical, engineering, and economic analysis, and testing, evaluation, and validation of methods and models; database creation, data extraction, and data manipulation

Table 2-1. Examples of work that involves the collection, generation, evaluation, analysis, or use of environmental data

Item	Examples
Data Use	Any use of data to support EPA decisions, regulations, policy, publications, or tools (including effluent guidelines, 304(m) program, standards, environmental assessments, and models, tools, or reports disseminated by EPA to assist other organizations in implementing environmental programs)

Note that QAPPs are required for the development or revision of models and software that support the generation, collection, evaluation, analysis, or use of data. (A model is set of equations and assumptions used to predict unknown data.) When existing models are used as a tool to generate or evaluate data, the project QAPP must describe the model and explain how it will be used and how its output will be evaluated to ensure the modeling effort meets the overall quality objectives for the project. Development or revision of new models also must be supported by a QAPP that describes the objectives for the model, the quality criteria that will be applied to the model, and the procedures for evaluating whether the model meets those criteria.

2.2 QA Project Plan Requirements

The Contractor has previously prepared a contract-wide Programmatic QAPP (PQAPP) for Contract EP-C-13-039 This PQAPP describes, in a single document, information that is not site or time-specific, but applies throughout the program (i.e., the duration of the contract). When tasked with preparing the PQAPP, the Contractor was informed that the PQAPP may need to be supplemented with project-specific details to support individual work assignments that involve the collection, generation, evaluation, analysis, or use of environmental data.

The activities in this work assignment may involve gathering, evaluating, analyzing, and otherwise using existing environmental data (also known as "secondary" use of data). However, EPA has determined that the Contractor is operating under the existing PQAPP and that the PQAPP addresses QA requirements for this work assignment. In support of this work assignment, the Contractor shall ensure that the work plan provides enough detail to clearly describe:

- Specific objectives of the project(s) supported by this work assignment, including typical questions that must be answered when using existing sources of data to perform economic analyses in support of the Steam Electric Industry Guidelines.

- The type of data to be gathered or used under this work assignment to support the project objectives—including data from search engines, federal databases, EPA data bases—as a well as a rationale for when those databases are appropriate and what data available in each will support the project

- The quality objectives needed to ensure the data will support the project objectives, and

- The Quality Assurance/Quality Control (QA/QC) activities to be performed to ensure that any results obtained are documented and are of the type, quality, transparency, and reproducibility needed.

2.3 Additional QA Documentation Required

The EPA Quality Manual for Environmental Programs (CIO 2105-P-01-0, May 2000) requires published Agency reports containing environmental data to be accompanied by a readily identifiable section or appendix that discusses the quality of the data and any limitations on the use of the data with respect to

their originally intended application. The EPA Quality Manual further requires Agency reports to be reviewed by the QA manager (or other authorized official) before publication to ensure that an adequate discussion of QA and QC activities is included. The purpose of the review is to ensure the reports provide enough information to enable a knowledgeable reader to determine if the technical and quality goals were met for the intended use of the data. Reports should include applicable statements regarding the use of any environmental data presented as a caution about possible misuse of the data for other purposes. For example, a Technical Support Document or Study Report must include a clear discussion of the quality management strategies (including the project goals and objectives, quality objectives and criteria, and QA/QC practices) that were employed to control and document the quality of data generated and used. These documents should also discuss any deviations from procedures documented in the EPA-approved QAPP(s) supporting the project, the reasons for those deviations, any impact of those deviations had on data quality, and steps taken to mitigate data quality issues.

In support of this Agency requirement, all major deliverables (e.g., Technical Support Documents, Study Reports, Analytical Methods) produced by the Contractor under this work assignment must include a discussion of the QA/QC activities that were performed to support the deliverable, and this discussion must provide a sufficient level of detail to allow the EAD QA Coordinator (or designee) to determine if the QA/QC strategies implemented for the project sufficiently support the intended use of the data. Upon receipt, the WACOR will review each applicable report and certify whether the Contractor has adhered to the QA requirements documented in the Contractor's PQAPP.

The Contractor also shall provide EPA with monthly reports of QA activities performed during implementation of this work assignment. These monthly QA reports shall identify QA activities performed to support implementation of this work assignment, problems encountered, deviations from the QAPP, and corrective actions taken. If desired, the Contractor may include this as a part of the contract-required monthly financial/technical progress report.

2.4 Data Quality Act/Information Quality Guidelines Requirements

The Data Quality Act (also known as the Information Quality Act) requires EPA to ensure that influential information disseminated by the Agency is sufficiently transparent in terms of data and methods of analysis that the information is capable of being substantially reproduced. To support compliance with these data transparency/ data reproducibility requirements, EPA plans to include QAPPs as part of any rulemaking record documentation to be made available to the public. (This includes PQAPPs and Supplemental (SQAPPs.)) The Contractor may claim information in QAPPs as confidential; if the Contractor chooses to do so, the Contractor shall submit a sanitized (i.e., public) version and an unsanitized (i.e., confidential) version at the time the QAPP is submitted for approval by EPA. The sanitized version shall be included in the public docket for the applicable rulemaking (or other docket record), and the unsanitized version shall be included in a non-public (i.e., confidential) portion of the docket (or record).

Information contained in the approved QAPP shall be transparent and reproducible and meet the requirements of the Data Quality Act for influential information. EPA's *Guidelines for Ensuring and Maximizing the Quality, Objectivity, Utility, and Integrity, of Information Disseminated by the Environmental Protection Agency* (EPA/260R-02-008, October 2002), referred to as "EPA's Information Quality Guidelines," describe EPA procedures for meeting Data Quality Act requirements. Section 6.3 of EPA's Information Quality Guidelines indicate that "especially rigorous robustness checks" should be applied in circumstances where quality-related information cannot be disclosed due to confidentiality issues. Where applicable, the Contractors should indicate which results were obtained using the tools (Standard Operation Procedures', checklists, and guidelines) that the Contractor designates as confidential

so that the EPA WACOR can easily identify the areas that shall require rigorous robustness checks and document that those checks have been performed. At the discretion of the EPA WACOR, the Contractors may be requested to prepare pre-dissemination review checklist as described in Section 5.5 of the Office of Water Quality Management Plan, February 2009. If this is required, the EPA WACOR shall notify the Contractor through written technical direction.

2.5 Task 2 QA Deliverables

Deliverable	Projected Schedule Date
Monthly reports of QA work performed (may be included in the Contractor's monthly progress report)	Monthly throughout the WA period of performance

Table 2-2. Justification for Use of Existing PQAPP as the Sole Quality Documentation for Projects that Rely on Existing Data for the Steam Electric Economic and Litigation support.

QAPP Element	Sufficiently Addressed in PQAPP	Not Applicable to Project	Explanatory Comments
A1. Title & Approval Sheet			
Project title	X		Steam Electric Economic and Litigation support
Organization's name	X		Abt Associates
Effective date and/or version identifier	X		Page ii of PQAPP
Dated signature of Organization's project manager	X		Page ii of PQAPP
Dated signature of Organization's QA manager	X		Page ii of PQAPP
Other signatures, as needed (e.g., EAD Project Officer, EAD QA Coordinator)	X		Page ii of PQAPP
Revision History	X		Page ii of PQAPP
A2. Table of Contents			
Includes sections, figures, tables, references, and appendices	X		Page v of PQAPP
Document control information indicated (when required by the EPA Project Manager and QA Manager)	X		Page v of PQAPP
A3. Distribution List			
Includes all individuals who are to implement or otherwise receive the QAPP and identifies their organization	X		2.1 pages 5-7 of PQAPP
A4. Project/Task Organization			
Identifies key individuals with their responsibilities (e.g., data users, decision makers, project QA manager, Subcontractors, etc.) and contact info.	X		Reference PQAPP section 2.1 on page 5. Referencing table 2.1 and descriptions on page 7 of PQAPPOST WACOR: James C. Covington, III
Organization chart shows lines of authority & reporting responsibilities	X		Reference PQAPP section 2.1 for overall picture
Project QA manager position indicates independence from unit collecting/using data	X		Reference PQAPP section 2.1 for overall picture
A5. Problem Definition/Background			
Clearly states problem to be resolved, decision to be made, or hypothesis to be tested	X		PQAPP Section 2.2 – goal of program is to conduct economic analyses for ELGs See PQAPP table 2-2: cost-benefit and economic impact analysis, industry profiles, collection /preparation of reports, review and analysis of public comments, legislative and litigation support, database development and management,. Also see WA
Identifies project objectives or goals	X		See WA
Historical & background information			
Cites applicable technical, regulatory, or program-specific quality standards, criteria, or objectives	X		Section 2.2 – goal of program is to conduct economic analyses for ELGs. See table 2-2 for specific analyses
A6. Project/Task Description			
List measurements to be made/data to obtain	X		Section 2.3 PQAPP
Notes special personnel or equipment requirements		x	
Provides work schedule		x	

QAPP Element	Sufficiently Addressed in PQAPP	Not Applicable to Project	Explanatory Comments
A7. Overall Quality Objectives & Criteria			
States overall quality objectives and limits needed to support the project goals and objectives cited in A5	X		See 2.3 of PQAPP
A8. Special Training Requirements/ Certifications			
Identifies specialized skills, training or certification requirements	X		See 2.5 of PQAPP
Discusses how this training will be provided/the necessary skills will be assured and documented	X		See 2.5 of PQAPP
A9. Project-level Documents & Records			
Describes process for distributing the approved QAPP and other planning documents (and updates) to staff	X		See section 2 of PQAPP
Identifies final work products that will result from the project	X		Section 2.6 of PQAPP
Describes the process for developing, reviewing, approving, and disseminating the final work products and individuals responsible for these processes	X		Appendix A of PQAPP
B1. Data Needs			
Detailed list/description of the specific data elements needed to support project goals	X		See Table 3-1 of PQAPP headings: Company Financial Data,, & Other Industry Data, & valuation and Economic Impact: including specifically:, US Census Bureau, EIA, RMS
Description of the scope of the data elements that you need (e.g., data supporting specific treatment options vs. the full range of options, data supporting the entire country vs. a specific geographic region)	X		See Table 3-1 of PQAPP headings: Company Financial Data,, & Other Industry Data, & valuation and Economic Impact: including specifically:, US Census Bureau, EIA, RMS
If project includes development or update of a project database, QAPP identifies and defines each database field		x	
B2. Potential Data Sources			
Identifies and describes potential sources of the existing data needed (e.g., photographs, topographical maps, facility or state files, census data, meteorological data, publications, etc.) and the rationale for their use	X		See Table 3.1 of PQAPP
If literature searches are used, describes the search engines that will be used and key search terms	X		See Table 3.1 of PQAPP
If databases or models will be used, describe the database (or model) in terms of who developed it and operates it and the type of data it contains	X		See table 3.2 of PQAPP
For other potential sources, describe the potential sources & rationale for considering or using each one		x	

QAPP Element	Sufficiently Addressed in PQAPP	Not Applicable to Project	Explanatory Comments
B3. Criteria for Selecting Data Sources			
Identifies each criterion that will be used to determine if the candidate data sources listed in B2 will meet your needs, and how each criterion is defined. (Criteria vary by project; examples include reliability, age, applicability, quantity, format, and others)	X		PQAPP 3.1.3 Criteria for Selecting Data Sources
Explains rating system used to evaluate source against each criterion		x	
B4. Data Value Selection Approach			
For data sources that meet the criteria identified in B3: Describes the criteria and procedures that will be used to determine which value(s) identified in the acceptable sources are most appropriate for use in the project	X		Section 3.1.4 of PQAPP
For data that do not meet these pre-established criteria but are the only data available, explains how the decision to use such data will be made and documented		x	
B5. Resolving Data Gaps			
Describes the process for identifying and addressing data gaps that still exist after candidate data sources have been evaluated and appropriate data values have been identified	X		Section 3.1.5 of PQAPP
Describes the process that will be used to address any new data needs revealed during the data gathering process (i.e., additional data elements not previously considered)		x	
B6. Data Gathering Documentation and Records			
Describes how results of the source selection and the data value selection will be documented, including any sources or values that were rejected and the rationale for not using them	X		See Section 3.1.6
For data that are deemed acceptable and that will be used, explains how each data element will be associated to its original source citation (i.e., bibliographic information, telephone contact reports, email messages, etc.)	X		See Section 3.1.6
C1. Standardization of Data Elements			
Describes the process to ensure that units and other key measures are captured and standardized (or otherwise made comparable) in the database	X		See Section 3.2.1

QAPP Element	Sufficiently Addressed in PQAPP	Not Applicable to Project	Explanatory Comments
If the project requires that all fields be standardized to a single set of units (e.g., US dollars for economic data, µg/L for chemical data), identifies the standard units that will be required for each data element	X		See Section 3.2.1
Identifies the procedures for converting data reported in other units to the standardized units, including any rounding or truncating procedures, and procedures for ensuring these conversions are performed correctly	X		See Section 3.2.1
If standardization of data elements is not needed, explains the process for ensuring that data presented in varying units are comparable enough for use in the project and that project staff members and other data users will be able to readily identify differences in units	X		See Section 3.2.1
C2. Data Entry			
Explains the process for manually entering selected data into the project database, who will be responsible for such data entry, and the QC strategies that will be used to ensure that the database accurately and completely captures the data as presented in the original source	X		See Section 3.2.2
C3. Merging or Uploading Electronic Data from Existing Sources			
If data are available electronically and will be uploaded or merged into the project database: describes the procedures that will be followed to ensure that errors are not introduced during the upload/merge process and that the final database reflects the original dataset(s)	X		See Section 3.2.3
C4. Data Review			
Describes the process for ensuring that the data have been recorded, transmitted, and processed correctly	X		See Section 3.2.4
C5. Data Storage and Manipulation			
Describes how the existing data will be stored	X		See Section 3.2.5
Describes who will be responsible for access to and maintenance of the stored data	X		See Section 3.2.5
Describes how the existing data will be incorporated with other project data to support the project goal/decision to be made	X		See Section 3.2.5

QAPP Element	Sufficiently Addressed in PQAPP	Not Applicable to Project	Explanatory Comments
Describes the QC strategies that will be employed to ensure that the integrity of the data is not compromised during data storage, access/retrieval, updates, or other manipulation	X		See Section 3.2.5
D1. Data Quality Verification and Data Quality Reporting			
Describes the process for verifying that the final set of data meets the overall criteria originally specified for the project	X		Section 3.3.1
Describes how these determinations will be documented and reported	X		Section 3.3.1
For data that don't meet the pre-established specifications, explains the process for determining if they are usable and how such decisions will be documented	X		Section 3.3.1
D2. Use/Analysis of the Existing Data			
Provides details regarding the exact means in which the data will be used to meet project objectives	X		Section 3.3.2
Includes an explanation or list of the information to be calculated and the data elements that will be used to make those calculations	X		Section 3.3.2
Includes applicable calculations and equations (if known) or explanations of how they will be developed	X		Section 3.3.2
Includes plans for excluding outliers	X		Section 3.3.2
D3. Methodology Documentation and Conceptual Review			
If exact methodologies for analyzing the data will need to be developed or modified during the course of data analysis, explains the process by which such methodologies will be documented, who is responsible for reviewing/ approving their use, and how the methodologies will be checked to ensure they yield the desired products	X		Section 3.2.3
D4. Technical Review of the Data Analysis			
Describes activities that will be used to ensure the data analyses are being implemented as specified and will support project objectives	X		Section 3.3.4
Explains procedures for identifying and notifying appropriate personnel if changes to the originally planned procedures are warranted, and the process for approving, documenting and implementing such changes	X		Section 3.3.4

QAPP Element	Sufficiently Addressed in PQAPP	Not Applicable to Project	Explanatory Comments
D5. Final Verification of Data Analysis and Reconciliation with User Requirements			
Describes the process for reviewing the final work product to ensure that the work was generated in accordance with the QAPP, and that the work product addresses the overall project goals and objectives	X		Section 3.3.5
Describes how the results of this assessment will be documented	X		Section 3.3.5
Describes how any limitations of the data or data analyses that were used to prepare the final work product will be documented and communicated	X		Section 3.3.5

Task 3 - Prepare Standardized Naming Convention and Version Control Memorandum

The contractor shall adhere to the EPA WACOR approved standardized naming convention and version control (SNCVC) plan that was developed under the Construction and Development WA 0-01 of the contract EP-C-07-023 (WA0-01_T1_SNCVC_08.31.07_V1.pdf). The contractor shall use this standardized convention for all deliverables associated with this work assignment.

The EPA WACOR may request the contractor through written technical direction to amend the SNCVC memorandum at any point under this WA. The EPA WACOR will review the revised memorandum and then provide the contractor with written notification of approval or edits that need to be made. The contractor shall prepare the edited SNCVC memorandum incorporating the EPA WACOR's comments, if required. After receiving notification of approval the contractor shall use the revised SNCVC.

Deliverables and schedule under Task 3
3a. SNCVC memorandum within 7 calendar days, if requested.
3b. If required, revised memorandum within 3 calendar days of receipt of comments from the EPA WACOR, at technical direction of EPA WACOR.

Task 4 – Provide Technical Support for Economic Cost and Impacts-Related Potential Litigation and Post-Promulgation Issues

The contractor shall provide technical support for economics issues, including costs and impacts related to the Economic Analysis, to address economics issues that may arise during potential litigation post-promulgation, as requested by the EPA WACOR. Deliverables may take the form of written responses to questions from the EPA WACOR arising during litigation about the economic benefits work conducted for the rulemaking; the preparation of memos and briefing materials including "one-pager" memos and PowerPoint presentations; additional analyses on topics provided by the EPA WACOR, and other written materials as requested by the EPA WACOR through written technical direction.

The EPA WACOR anticipates that between five and ten requests for support will be made, and that 50 percent of the requests will require quick turn-around. The contractor shall submit draft deliverable materials to the EPA WACOR for review and comment. The contractor shall incorporate the EPA WACOR's comments and produce final versions of the materials incorporating the EPA WACOR's comments.

Deliverables and schedule under Task 4
Task 4 Draft deliverables and due dates To Be Determined (TBD) by written technical direction.
Task 4 Final deliverable due dates TBD by written technical direction.

Task 5 Provide Technical Support for Economic Benefits-related Potential Litigation and Post-Promulgation Issues
The contractor shall provide economics support to address issues related to the economic benefits work, including the stated preference survey, that arise during potential litigation post-promulgation, as requested by the EPA WACOR. Deliverables may take the form of written responses to questions from the EPA WACOR arising during litigation about the economic benefits work conducted for the rulemaking; the preparation of memos and briefing materials including "one-pager" memos and PowerPoint presentations; additional analyses on topics provided by the EPA WACOR, and other written materials as requested by the EPA WACOR through written technical direction.

The EPA WACOR is anticipating that between five and ten requests for support will be made, and that 50 percent of the requests will require quick turn-around. The contractor shall submit draft deliverable materials to the EPA WACOR for review and comment. The contractor shall incorporate the EPA WACOR's comments and produce final versions of the materials incorporating the EPA WACOR's comments.

Deliverables and schedule under Task 5
Task 5 Draft deliverables and due dates TBD initially by written technical direction.
Task 5 Final deliverable due dates TBD initially or written technical direction.

EPA

United States Environmental Protection Agency
Washington, DC 20460

Work Assignment

Work Assignment Number: 3-05

☐ Other ☐ Amendment Number:

Contract Number	Contract Period	Title of Work Assignment/SF Site Name
EP-C-13-039	09/11/2013 To 07/31/2017	SE Econ Lit Support
	Base Option Period Number 3	

Contractor	Specify Section and paragraph of Contract SOW
ABT ASSOCIATES INC.	A1

Purpose:
- [X] Work Assignment
- [ ] Work Assignment Amendment
- [X] Work Plan Approval
- [ ] Work Assignment Close-Out
- [ ] Incremental Funding

Period of Performance: From 08/01/2016 To 07/31/2017

Comments:

☐ Superfund — Accounting and Appropriations Data — [X] Non-Superfund

Note: To report additional accounting and appropriations date use EPA Form 1900-69A.

SFO (*Max 2*): ☐

Line	DCN (Max 6)	Budget/FY (Max 4)	Appropriation Code (Max 6)	Budget Org/Code (Max 7)	Program Element (Max 9)	Object Class (Max 4)	Amount (Dollars)	(Cents)	Site/Project (Max 8)	Cost Org/Code
1										
2										
3										
4										
5										

Authorized Work Assignment Ceiling

	Cost/Fee	LOE
Contract Period: 09/11/2013 To 07/31/2017	$0.00	0
This Action:	$40,715.00	300
Total:	$40,715.00	300

Work Plan / Cost Estimate Approvals

	Cost/Fee	LOE
Contractor WP Dated: 08/16/2016	$40,715.00	300
Cumulative Approved:	$40,715.00	300

Work Assignment Manager Name: James Covington	Branch/Mail Code:
(Signature) (Date)	Phone Number: 202-566-1034
	FAX Number:
Project Officer Name: Ahmar Siddiqui	Branch/Mail Code:
(Signature) (Date)	Phone Number: 202-566-1044
	FAX Number:
Other Agency Official Name	Branch/Mail Code:
(Signature) (Date)	Phone Number:
	FAX Number:
Contracting Official Name: Tammy Adams	Branch/Mail Code:
TAMMY ADAMS Digitally signed by TAMMY ADAMS DN: c=US, o=U.S. Government, ou=USEPA, ou=Staff, cn=TAMMY ADAMS, dnQualifier=0000018417 Date: 2016.08.23 13:15:29 -04'00'	Phone Number: 513-487-2030
(Signature) (Date)	FAX Number: 513-487-2545

EPA

United States Environmental Protection Agency
Washington, DC 20460

Work Assignment

Work Assignment Number: 3-07

☐ Other ☐ Amendment Number:

Contract Number	Contract Period	Title of Work Assignment/SF Site Name
EP-C-13-039	09/11/2013 To 07/31/2017	Enhancements to WMOST
	Base Option Period Number 3	

Contractor: ABT ASSOCIATES INC.

Specify Section and paragraph of Contract SOW: A2.1,A2.2,A2.3,A3,A6,B1,C1,C7,D1,D2,G

Purpose:
- [X] Work Assignment
- [ ] Work Assignment Amendment
- [ ] Work Plan Approval
- [ ] Work Assignment Close-Out
- [ ] Incremental Funding

Period of Performance: From 08/01/2016 To 07/31/2017

Comments:
Performance on this Work Assignment shall not begin until August 1, 2016.

☐ Superfund — Accounting and Appropriations Data — [X] Non-Superfund

SFO (*Max 2*): ☐

Note: To report additional accounting and appropriations date use EPA Form 1900-69A.

Line	DCN (Max 6)	Budget/FY (Max 4)	Appropriation Code (Max 6)	Budget Org/Code (Max 7)	Program Element (Max 9)	Object Class (Max 4)	Amount (Dollars)	(Cents)	Site/Project (Max 8)	Cost Org/Code
1										
2										
3										
4										
5										

Authorized Work Assignment Ceiling

	Cost/Fee	LOE
Contract Period: 09/11/2013 To 07/31/2017		0
This Action:		1,409
Total:		1,409

Work Plan / Cost Estimate Approvals

	Cost/Fee	LOE
Contractor WP Dated:		
Cumulative Approved:		

Work Assignment Manager Name: Naomi Detenbeck (Signature) (Date)	Branch/Mail Code: Phone Number: 401-782-3162 FAX Number:
Project Officer Name: Ahmar Siddiqui (Signature) (Date)	Branch/Mail Code: Phone Number: 202-566-1044 FAX Number:
Other Agency Official Name: (Signature) (Date)	Branch/Mail Code: Phone Number: FAX Number:
Contracting Official Name: Tammy Adams TAMMY ADAMS Digitally signed by TAMMY ADAMS DN: c=US, o=U.S. Government, ou=USEPA, ou=Staff, cn=TAMMY ADAMS, dnQualifier=0000018417 Date: 2016.07.20 07:26:48 -04'00' (Signature) (Date)	Branch/Mail Code: Phone Number: 513-487-2030 FAX Number: 513-487-2545

WORK ASSIGNMENT

I. Title: ENHANCEMENTS TO THE WATERSHED MANAGEMENT OPTIMIZATION SUPPORT TOOL (WMOST)

Contractor: Abt Associates **Contract No.:** EP-C-13-039

II. Work Assignment Number: 3-07

III. Estimated Period of Performance: August 1, 2016 through July 31, 2017

IV. Estimated Level of Effort: 1409

V. Key EPA Personnel:

Work Assignment Contracting Officer Representative (WACOR):

Naomi Detenbeck
US EPA Atlantic Ecology Division
27 Tarzwell Drive
Narragansett, RI 02882
401/782-3162
401/782-3030 (fax)

Alternate Work Assignment Contracting Officer Representative (Alt WACOR):

Marilyn ten Brink
US EPA Atlantic Ecology Division
27 Tarzwell Drive
Narragansett, RI 02882
401/782-3078
401/782-3030 (fax)

VI. Background and Purpose:

The 1972 Clean Water Act (CWA) directs the Environmental Protection Agency (EPA) to develop national technology-based regulations for categories of industries that discharge pollutants directly to surface waters (effluent guidelines) or that discharge pollutants indirectly through sewage treatment plants (pretreatment standards). The CWA also directs EPA to develop national technology-based regulations for new industrial facilities (new source performance standards).

Under Executive Orders 12866 and 13563, EPA is required to estimate the potential benefits and costs to society. As such, the purpose of this Work Assignment (WA) is to update the EPA-supported Watershed Management Optimization Support Tool (WMOST v. 1, v. 2 and v. 2.1; US EPA 2013a,b; 2015, 2016) for use in Integrated Planning (http://water.epa.gov/infrastructure/greeninfrastructure/upload/memointegratedmunicipalplans.p

df) and Integrated Water Resources Management (IWRM; Zoltay 2007, Zoltay et al. 2010). The WMOST tool currently focuses on water quantity goals: maintaining minimum flows adequate to support aquatic life use, reducing flooding risks and costs, and meeting human water demands (US EPA 2013a, b; 2015, 2016). WMOST is designed to be a user-friendly decision support tool to allow communities to evaluate and optimize the relative costs and benefits of water resource management options, including implementation of green infrastructure stormwater best management practices (BMPs), land conservation, low impact development (LID), water re-use, aquifer storage and recovery, and repair of existing infrastructure to fix infiltration/inflow problems. The tool has been demonstrated with pilot studies (upper Ipswich, Danvers/Middleton, Halifax, Massachusetts (MA)).

WMOST will be modified to add 1) a water quality module to evaluate the effect and cost-effectiveness of watershed management options (including the use of green infrastructure stormwater BMPs) on reduction of nutrient loads and concentrations, 2) a combined sewer overflow (CSO) module to evaluate the effect and cost effectiveness of management options on reduction or elimination of CSOs, and 3) a climate change module to facilitate comparison of optimal solutions across climate change scenarios and to support robust decision-making. The WMOST software is a contract deliverable and is being provided to EPA with "unlimited rights," as that term is defined in FAR 52.227-14(a) (1987). The new modules will be evaluated through application to one or more case studies.

The first goal of this work assignment is to complete a water quality module for inclusion in WMOST version 3. WMOST versions 1 and 2 allowed users to optimize selection of water management options to meet minimum and maximum flow targets in the most cost-effective fashion subject to user-specified constraints. Version 3 of WMOST will be designed to include a water quality module to allow users to manage for water-quality based targets as well as water quantity-based targets. The initial water quality module will focus on management of targets for annual loading of nutrients, suspended sediment, and heavy metals to meet total maximum daily load (TMDL) and permit requirements. Subsequent versions of WMOST will be refined to allow the user to specify water quality targets for finer time steps to support water quality standards. Options will be explored to evaluate options to expand application of the water quality module to other regions of the country. The first option builds off of functionality built into the stormwater BMP module of WMOST version 2 which interacts with the EPA System for Stormwater Treatment and Analysis (SUSTAIN) tool ((http://www2.epa.gov/water-research/system-urban-stormwater-treatment-and-analysis-integration-sustain) to calculate to estimate water balance modifications associated with stormwater BMP practices. EPA Region 1 is currently building an optimization application called "Opti-Tool" which will provide default inputs to the SUSTAIN tool suitable for New England municipalities, including loading time series for land generated using the EPA Stormwater Management Model (SWMM) model and historic climate records for Boston, MA, BMP design specifications, BMP performance metrics, and annual loading coefficients for nitrogen, phosphorus, sediment, and zinc associated with specific land-use classes in New England. Those inputs have been provided for incorporation into WMOST. The first option will be designed so that users can update default New England settings to values appropriate for other EPA Regions, including the use of SUSTAIN- or SWMM-generated hydrograph and pollutographs for developed land. The contractor should

assess whether it would be more efficient to generate a set of regional time series of SUSTAIN- or SWMM-generated hydrographs and pollutographs for the user to apply as default inputs. Options for expanding the water quality module include generation of loading time series for other regions of the country using SWMM with regionally-calibrated build-up/wash-off curves based on information in the National Urban Runoff Program databases (US EPA 2005) and expansion of available BMP parameters calibrated for different regions of the country.

EPA intends to add functionality to WMOST to allow the user to establish targets for minimizing or eliminating sewer overflows using a strategy consistent with the Combined Sewer Overflow (CSO) Green Long-Term Control Plan (LTCP) Template for Small Communities (termed the *Green LTCP-EZ Template*). The Green LTCP-EZ Template is a planning tool for small communities that are required to develop an LTCP to address CSOs. The Green LTCP-EZ Template provides a framework for organizing and completing an LTCP that builds on existing controls, including the use of both green and conventional gray infrastructures to assist in the elimination or control of CSOs in accordance with the federal Clean Water Act (CWA).

In May 2007, U.S. EPA developed a planning tool (LTCP-EZ) for small CSO communities to design long-term CSO control plans using the conventional gray CSO controls. The original LTCP-EZ Template is available at www.epa.gov/npdes/cso. The Green LTCP-EZ Template is an updated version of the original, in that it adds several "green" infrastructure practices such as green roofs, vegetated swales, bioretention basins, pervious pavements, rain barrels, in conjunction with conventional gray CSO control to develop a CSO long-term control plan. The Green LTCP-EZ can be used for communities who want to assess the potential for green infrastructure controls. Schedule 4 – CSO VOLUME provides a process for assessing CSO control needs under the *presumption approach* of the CSO Control Policy. It allows the permittee or other user to estimate a target volume of combined sewage that needs to be stored, treated, or eliminated. Schedules 5A and 5B– CSO RUNOFF, NETWORK AND Wastewater Treatment Plant (WWTP) CONTROLS enable the permittee to evaluate the ability of a number of widely used green infrastructure runoff controls and pipe network CSO controls to meet the reduction target. FORM GREEN LTCP-EZ and its schedules are available in hard copy format or as computer-based spreadsheets.

EPA also plans to add functionality to WMOST to allow users to evaluate the effect of management options under various climate change scenarios to support robust decision-making. Robust decision-making (RDM) "is a new approach that can incorporate uncertain scientific and socioeconomic information into water quality implementation plans. RDM differs from many of the analytic approaches currently used by USEPA in that it employs a "backward" analysis. Rather than beginning with an agreed upon set of assumptions about the future, RDM begins with a proposed plan or plans, uses analytics to stress-test them over many futures, and concisely summarizes the conditions in which each plan will work well or poorly. RDM adopts an "exploratory modeling" approach that uses simulation models not as tools for prediction, but simply as a means to map assumptions onto consequences without necessarily privileging one assumption over another. RDM can significantly enhance the value of simulation models initially

designed for predictive analysis by running them over many plausible paths into the future in order to identify vulnerabilities of proposed strategies and potential robust responses."[1]

Under this work assignment the contractor shall conduct all analyses requiring the collection and manipulation of data and models in accordance with the EPA approved quality assurance (QA) project plan that will be based on Task 2 QAPP language. The QA project plan shall describe the procedures for assuring the quality of the primary and secondary environmental and economic data used for this work assignment.

In carrying out the tasks specified in this work assignment, the contractor may be called upon to build upon and continue work performed under WA 6-32 and 5-32 under the Contract EP-C-07-023, and work assignments 1-07 and 2-07 under the current Contract EP-C-13-039. The work performed under this work assignment will not duplicate work conducted under the previous work assignments.

References cited in Background

Medina, D., E. Monfils, and Z. Baccala, (2011), "Quantifying the Benefits of Green Infrastructure for Floodplain Management," *Proceedings of the EWRI World Environmental and Water Resources Congress*, Palm Springs, California.

U.S. EPA. 2005. The National Stormwater Quality Database, Version 1.1 A Compilation and Analysis of NPDES Stormwater Monitoring Information. U.S. Environmental Protection Agency, Office of Water, Washington, D.C.

U.S. EPA. 2013a. Watershed Management Optimization Support Tool (WMOST) v1: Theoretical Documentation. US EPA Office of Research and Development, Washington, DC, EPA/600/R-13/151, 2013.

U.S. EPA. 2013b. Watershed Management Optimization Support Tool (WMOST) v1: User Manual and Case Study Examples. US EPA Office of Research and Development, Washington, DC, EPA/600/R-13/174, 2013.

Zoltay, V.I. 2007. Integrated watershed management modeling: Optimal decision making for natural and human components. M.S. Thesis, Tufts Univ., Medford, MA.

Zoltay, V.I., R.M. Vogel, P.H. Kirshen, and K.S. Westphal. 2010. Integrated watershed management modeling: Generic optimization model applied to the Ipswich River Basin. Journal of Water Resources Planning and Management.

Under the previous work assignment(s), Abt Associates performed the following analyses:

- Development of WMOST v1 with associated theoretical documentation, user guide, and case study reports

1 http://www.rand.org/pubs/research_reports/RR720.html

- Support for WMOST v1 workshop at EPA Region 1 in Chelmsford
- Development of WMOST v2 with associated theoretical documentation, user guide and case study reports
- Development of WMOST v2.1 with associated documentation of corrected program bugs
- Development of training material for workshop held at EPA Region 1 on June 8
- Draft technical memoranda describing approach to new water quality module
- Draft (untested) version of water quality module with associated loadings database for New England
- Draft technical memorandum describing approach to new hydrology pre-processor
- Draft hydrology pre-processor
- Draft climate screening interface tool
- Draft technical memorandum describing approach to new climate change scenario comparison module
- Draft technical memorandum describing approach to expanding access to pre-processed data for hydrology module

VII. General Requirements of the Work Assignment and Schedule

Confidential Business Information: During the course of the work assignment, the contractor will not be accessing and evaluating CBI.

Budget Reporting: The contractor under this work assignment is required to report to the EPA WACOR and Contract-Level Contracting Officer Representative (CL-COR) when 75 percent of the total work assignment funding amount has been depleted. The contractor must also report to the EPA WACOR when 75 percent of the approved Workplan budget has been depleted.

Identification as Contracting Staff: To avoid the perception that contractor personnel are EPA employees, contractor personnel shall be clearly identified as independent contractors of EPA when participating in events with outside parties and prior to the start of any meeting. Contractor personnel are prohibited from acting as the Agency's official representative. When speaking with the public, the contractor should refer all interpretations of policy to the EPA WACOR.

Limitation of Contractor Activities: The contractor shall submit drafts of all deliverables to the EPA WACOR for review prior to submission of the final product. These drafts will clearly specify the methods, procedures, considerations, assumptions, relevant citations, data sources and data that support any conclusions and recommendations. The contractor shall incorporate all EPA WACOR comments into all final deliverables, unless otherwise agreed upon by the EPA WACOR. The contractor shall adhere to all applicable EPA management control procedures as implemented by the EPA Contracting Officer (CO), EPA CL-COR, and EPA WACOR.

Quick Response: Under this Performance Work Statement the contractor may be required to provide information for use by EPA for quick responses and analyses of options, issues, and policy decisions. Quick responses are those which require completion in one to five working days.

Travel:
The contractor shall be required to travel under this work assignment for a training workshop and stakeholder meetings in New England. Travel may be to participate with EPA in on site data collection, in meetings with trade associations, and to meet with EPA to discuss methodology and other important issues associated with the project. A request for approval for any travel directly chargeable to this work assignment must be submitted and approved by the CL-COR before travel begins.

Deliverable Formatting: All memos, draft comments, summaries and responses, and chapters are to be provided in electronic form using Word and/or Excel/Access, ArcMap, or, in special cases another software program agreed to by EPA. Memos are to be written in a manner which will make them easy to turn into draft chapters for the Final Report. For deliverables that are in Word or pdf versions of Word documents, that are intended to be shared with management or the public, the contractor shall use decimal align in all tables containing columns of numbers of varying digits, whether decimal places are reported or not. All final materials, e.g., memos, chapters, etc. are to be prepared only after receiving written technical direction from the EPA WACOR and will be formatted to be in compliance with the Section 508 Amendment to the Rehabilitation Act of 1973.

VIII. Performance Work Statement (PWS)

The EPA WACOR will review all deliverables in draft form and provide revisions and/or comments to the contractor. The contractor shall prepare the final deliverables incorporating the EPA WACOR's comments.

Task 1 - Prepare Workplan

The contractor shall prepare a workplan within 15 calendar days of receipt of the WA. The workplan shall outline, describe and include the technical approach, resources, timeline and due dates for deliverables, a detailed cost estimate by task, and a staffing plan. The EPA WACOR, the CL-COR and the CO will review the workplan. However, only the CO can approve/disapprove, suggest revisions, or change the workplan. Official revisions will be given to the contractor by the Contracting Officer. The contractor shall prepare a revised workplan incorporating the Contracting Officer's comments, if required.
A biweekly update call with the EPA WACOR will be required for this work assignment to discuss progress on deliverables, costs, and other potential issues.

Deliverables and schedule under Task 1

1a. Workplan within 15 calendar days of receipt of work assignment.

Task 2 - Quality Assurance (Contract PWS Section G)

An existing Quality Assurance Project Plan (QAPP), which was developed under WA 1-07 to describe the development of WMOST v.2, shall be updated as needed to cover the updated

activities of the current work assignment. The contractor shall adhere to the QAPP which documents how quality assurance and quality control will be applied to the collection and use of environmental and economic data under this work assignment. The QAPP assures that any results obtained are of the type and quality needed and expected under this work assignment. The QAPP addresses the collection and use of wastewater sampling data, facility questionnaire data, any models to be used, secondary data (including the acceptance criteria), any new database management requirements and any other relevant work that might affect the quality of the data. The QAPP describes the controls to ensure high-quality data entry. The text of the QAPP also explicitly identifies tools that the contractor shall use in the project to document reproducibility and traceability, such as standard operating procedures (SOPs), checklists, and guidelines. Tools should be provided as attachments to the QAPP.

The contractor shall document QA activities in any major deliverable. Work conducted under a QAPP must be included in progress reports at least monthly unless otherwise requested by the EPA WACOR and include QA performed, problems encountered, deviations from the QAPP and corrective actions taken.

The EPA WACOR will review the revised QAPP and then provide the contractor with written notification of approval or edits that need to be made through written technical direction. The contractor shall prepare the edited QAPP incorporating the EPA WACOR's comments, if required. After receiving notification of approval the contractor shall adhere to the revised QAPP.

Deliverables and schedule under Task 2

2a. Revised QAPP within 14 calendar days of EPA WACOR technical direction.
2b. If additional edits are required QAPP must be updated within 5 calendar days of receipt of comments from the EPA WACOR, at technical direction of EPA WACOR.
2c. At a minimum report monthly on QA work within the monthly progress report.

Task 3 - Prepare Standardized Naming Convention and Version Control Memorandum

The contractor shall adhere to the EPA WACOR approved standardized naming convention and version control (SNCVC) plan that was developed under the Construction and Development WA 0-01 of the contract EP-C-07-023 (WA0-01_T1_SNCVC_08.31.07_V1.pdf). The contractor shall use this standardized convention for all deliverables associated with this work assignment.

The EPA WACOR may request the contractor through written technical direction to amend the SNCVC memorandum at any point under this WA. The EPA WACOR will review the revised memorandum and then provide the contractor with written notification of approval or edits that need to be made. The contractor shall prepare the edited SNCVC memorandum incorporating the EPA WACOR's comments, if required. After receiving notification of approval the contractor shall use the revised SNCVC.

Deliverables and schedule under Task 3

3a. If required, revised memorandum within 3 calendar days of receipt of comments from the EPA WACOR, at technical direction of EPA WACOR.

Task 4 – Case study application of WMOST v.3 beta (Contract PWS Section B)
The contractor shall apply the WMOST v.3 beta version with water quality and climate change scenario modules to a pilot study involving the communities of Halifax and Brockton in the Taunton River watershed in Massachusetts. The contractor shall interact with the communities identified by US EPA to identify and compile data required for the case study and to identify scenarios of interest to be evaluated for the communities. EPA will set up the scoping and demonstration meetings with communities (see Task 5 below). EPA shall obtain the input and output data files (e.g., unit runoff and infiltration rate time series, baseflow recession coefficient) from the United States Geological Survey (USGS) Hydrologic Simulation Program in Fortran (HSPF) model for the Taunton River for WMOST input. EPA will provide HSPF model files (Barbero and Sorenson 2012) for the portion of the Taunton River watershed of interest based on 1) an historic period of record encompassing wet and dry climate extremes and 2) for future climate scenarios (based on results provided through interagency agreements with USGS), and 3) Soil and Water Assessment Tool (SWAT) input files generated using climate change projections for the adjacent New England Coastal Basins for EPA's Twenty Watershed Study (US EPA 2013). The contractor shall apply the WMOST v.3 beta version with water quality modules to the pilot study involving the communities of Halifax and Brockton in the Taunton River watershed in Massachusetts. The contractor shall interact with the communities to identify and compile additional data requirements needed for the water quality modelling components of WMOST.

Deliverables and schedule under Task 4 (due dates listed or modified by written technical direction).

4a. Draft documentation of additional data sources for Taunton River community pilot case study for WMOST v.3 (water quality components) (August 31, 2016)
4b. If additional edits are required the draft documentation of data sources for Halifax community pilot case study for WMOST v3 will be revised within 7 calendar days of receipt of written comments from the EPA WACOR, at technical direction of EPA WACOR.
4c. WMOST v3 populated with Halifax case study data and results of baseline calibration run with accompanying technical memo describing model inputs, outputs and assumptions (October 31, 2016)
4d. If additional edits are required the WMOST v3 file with Halifax case study data will be revised within 14 calendar days of receipt of written comments from the EPA WACOR, at technical direction of EPA WACOR.

Task 5 – Stakeholder meetings (Contract PWS Sections B, D)

EPA shall be responsible for any preliminary meetings necessary to explain and to establish approaches and water quality targets for the modified case study and to provide updates on development of the water quality module. The contractor shall prepare an oral presentation for

stakeholders presenting the results of applying WMOST v.3 and the associated water quality module to the Monponsett Ponds case study.

Deliverables and schedule under Task 5 (due dates listed or modified by written technical direction).

5a. Participation in discussion of scenarios of interest to WMOST stakeholders in pilot communitie(s).
5b. Draft Powerpoint presentation of WMOST v3 case study results to stakeholders within 7 calendar days of written technical direction of WACOR.
5c. If additional edits are required the draft case study presentation shall be updated within 5 calendar days of receipt of comments from the EPA WACOR, at technical direction of EPA WACOR.
5d. Oral presentation of WMOST v3 case study results to stakeholders within 7 days of written technical direction of WACOR. This deliverable may be delayed based on scheduling of stakeholder meetings beyond the control of the EPA WACOR.

Task 6 – Update of WMOST theoretical documentation and user guide with water quality, climate change, and CSO modules and case study results (Contract PWS Sections A, B, C1)

The final tool formatted for use with MS EXCEL 2013 and 2016 will be provided along with a set of updated instructions on how to apply WMOST v.3. The contractor and EPA agree that the software that is developed under the work assignment (WMOST v.3), including the original software developed by Viktoria Zoltay which is being modified and incorporated into the WMOST versions, is a contract deliverable and is being provided to EPA with "unlimited rights," as that term is defined in FAR 52.227-14(a) (1987). The contractor shall provide updates for both the existing theoretical documentation for WMOST (US EPA 2015a) and the existing user manual (US EPA 2016) and provide copies in both Word and pdf formats as deliverables. The theoretical documentation and user manual shall also be provided with unlimited rights. The contractor shall revise the theoretical documentation and user guide in response to EPA and reviewer comments. In the past, case studies have been published as an appendix to the user guide. For subsequent versions, EPA may publish these as a separate report to avoid delays in release of the user guide.

Deliverables and schedule under Task 6 (due dates listed or modified by written technical direction).

6.a. Draft updated WMOST v.3. documentation (both theoretical documentation and user guide sections) including corrections to version 2 documentation embodied in version 2.1, water quality modules, hydrology pre-processor tool, and climate scenario comparison module (October 31, 2016).
6.b. If additional edits are required the revised WMOST v.3 documentation shall be updated within 14 calendar days of receipt of comments from the EPA WACOR, at technical direction of EPA WACOR. Initial comments will be provided by the EPA WACOR upon receipt of the draft products and then again after the Office of Research and Development

(ORD) peer review comments have been received.
6.c. Draft updated documentation and user guide for CSO module (November 30, 2016)
6.d. If additional edits are required the revised CSO module documentation shall be updated within 14 calendar days of receipt of comments from the EPA WACOR, at technical direction of EPA WACOR. Initial comments will be provided by the EPA WACOR upon receipt of the draft products and then again after the ORD peer review comments have been received.

Task 7 -- Addition of simple water quality module to WMOST v.2 (Contract PWS Sections A,B)

The contractor shall explore options for addition of modules to WMOST v.2 to incorporate water quality goals for lakes and streams or rivers. New modules will be tested as part of the Halifax-Brockton pilot study (Task 4 above). Annual or growing season nutrient targets for lakes and ponds will be evaluated based on simple Vollenweider-type loading models, with annual or seasonal loads based on loading coefficients associated with Hydrologic Response Units (HRUs), supplemented by nutrient movements associated with interbasin transfers and estimated reductions in loads associated with stormwater BMPs.

The draft output for Task 7a was completed during Option Period 2. Effect of best management practices on achieving nutrient targets were evaluated through use of loading coefficients, loading time series, build-up/wash-off coefficients, and BMP performance characteristics generated by EPA Region 1 in support of their Opti-Tool application. The Opti-Tool is under development through a contract with TetraTech with support from EPA Region 1 and scheduled to be released in July 2016. The Opti-Tool is an Excel-spreadsheet based tool designed to provide an optimized BMP performance plan for municipal and consulting decision-makers charged with developing sound and affordable stormwater/nutrient management plans. The spreadsheet tool will provide the ability to evaluate options for the best mix of structural and nonstructural BMPs, including low impact development (LID) and green infrastructure (GI) practices in a particular geographic area. Key BMP simulation and optimization routines are being incorporated from EPA's System for Urban Stormwater Treatment and Analysis Integration (SUSTAIN) model (http://www.epa.gov/water-research/system-urban-stormwater-treatment-and-analysis-integration-sustain/) into a user-friendly spreadsheet tool format. The tool will incorporate existing data and stormwater BMP performance curves for total phosphorus, total nitrogen, total suspended solids, and zinc from EPA Region 1. The Opti-Tool will provide time series of flow and concentration that will be compatible with EPA Region 1's current estimates of total phosphorus (TP) and total nitrogen (TN) annual export loads and event-mean concentrations for the pollutants and region of interest from the National Urban Runoff database.

Task 7a. Water quality module development and mass balance quality assurance/quality control (QA/QC)

The contractor shall create a water quality module for WMOST which allows users to establish management targets for either annual loads or concentrations of pollutants. The initial focus will

be on annual loading targets. The first option to be developed builds off of functionality built into the stormwater BMP module of WMOST version 2 which interacts with the EPA SUSTAIN tool to estimate water balance modifications associated with stormwater BMP practices. EPA Region 1 has supported development of an application called "Opti-Tool" which provides the following default inputs to SUSTAIN suitable for New England municipalities: 1) loading time series for developed land generated using the EPA Stormwater Management Model (SWMM) model and historic climate records for Boston, MA, 2) BMP design specifications, 3) BMP performance metrics, and 4) annual loading coefficients for nitrogen, phosphorus, sediment, and zinc associated with specific land-use classes in New England. EPA has made those inputs available for incorporation into WMOST. The first option shall be designed so that users can update default New England settings to values appropriate for other EPA Regions.

The contractor shall design and change the WMOST Excel interface and Visual Basic for Applications (VBA) coding to incorporate loading data, and code equations describing new optimization set-up for water quality. The contractor shall perform a mass balance quality assurance based on both flows and loadings to test recoding for the new nonlinear solver.

Task 7b. Development of a loadings data base for New England (completed during Option Period 2)

Task 7c. Options to expand the geographic extent of application of the water quality module beyond New England

The contractor shall evaluate options to facilitate the application of the water quality module to other regions beyond New England. One option is to develop regionally-calibrated build-up/washoff coefficients to be used in conjunction with SUSTAIN or SWMM simulations to generate water quality loading time series (Butcher 2003). A second option is to develop additional loading databases, e.g., for the Chesapeake Bay watershed based on the Chesapeake Bay HSPF model. A third option is to expand the library of BMPs and regional BMP performance parameters available to use with SUSTAIN/SWMM algorithms. The contractor shall design the module to allow the user to import alternate loading datasets. Enhancements to the initial water quality module should be coordinated with needs identified for WMOST case studies (Tasks 4 and 12).

Deliverables and schedule under Task 7 (due dates listed or modified by written technical direction).

7a. Technical memo reporting results of QA Mass Balance testing for water quality module (September 30, 2016)

7b. If additional edits are required the revised WMOST v.3 tool shall be updated within 14 calendar days of receipt of comments from the EPA WACOR, at technical direction of EPA WACOR. Initial edit requests will be based on EPA WACOR review but additional edits may be required based on peer review process of next release of WMOST v. 3.

7c. Draft technical memo with approaches for enhancing water quality module – including additional loading databases, additional SUSTAIN/SWMM simulation runs with regionally calibrated build-up/wash-off coefficients, and additional regional BMP parameter sets for SWMM simulations (September 30, 2016)

7d. Revised technical memo with approach for enhancing water quality module for expanded geographic application (Within 2 weeks of receipt of comments by EPA WACOR).

7e. Draft enhanced water quality module incorporating EPA-approved approaches (within one month of receiving written technical direction of EPA WACOR)

7f. Final enhanced water quality module incorporating EPA-approved approaches (within two weeks of receiving feedback from EPA WACOR)

References included under Task 7

Butcher, J.B., 2003. Buildup, Washoff, and Event Mean Concentrations. Journal of the American Water Resources Association (JAWRA) 39(6):1521-1528.

Moore, R B., C M. Johnston, R A. Smith, and B Milstead, 2011. Source and Delivery of Nutrients to Receiving Waters in the Northeastern and Mid-Atlantic Regions of the United States. Journal of the American Water Resources Association (JAWRA) 47(5):965-990.

US EPA 1997 Compendium of Tools for Watershed Assessment and TMDL Development. US EPA Office of Water, Washington, DC. EPA841-B-97-006.

U.S. EPA. 2005. The National Stormwater Quality Database, Version 1.1 A Compilation and Analysis of NPDES Stormwater Monitoring Information. U.S. Environmental Protection Agency, Office of Water, Washington, D.C.

Task 8 – Enhancement of automated hydrologic time series capability in WMOST v.2 and development of climate screening interface for use with WMOST v.2 (due dates listed or modified by written technical direction). (Contract PWS Sections A, B)

Building on the work performed under Task 4 of WA 2-07, the contractor shall create a pre-processor to facilitate efficient addition of hydrologic model outputs into WMOST. Under this WA, work shall focus on the ability to import model results from HSPF and from SWAT, the two watershed modeling systems used in EPA's 20 Watershed project.[2] The contractor shall design and implement a pre-processor that reads output files generated at a daily or hourly time step from SWAT and/or HSPF and makes the necessary data conversions to produce a WMOST hydrology data set. It is possible that some users will have access to model outputs generated at a daily time step but will wish to use the stormwater hydrology module within WMOST, for which hourly time steps are most appropriate. The pre-processor shall include options to disaggregate model output at a daily time step to time series at an hourly time step resolution. Model output

2 http://cfpub.epa.gov/ncea/global/recordisplay.cfm?deid=256912

from two specific SWAT and HSPF models drawn from the larger 20 Watersheds collection of models – the New England SWAT model and the Susquehanna HSPF model – shall be added to the WMOST data library using the preprocessors developed under this task, including baseline runs and two climate change scenarios for each model. (Land-use scenarios will not be included at this stage.) EPA will provide input on which two climate change scenarios to include for each model.

The existing Watershed Data Management (WDM) files generated for the 20 Watersheds Study did not include all of the data required for WMOST hydrology databases, i.e., time series were not saved for individual Hydrologic Response Units (HRUs) and time series were saved as daily rather than hourly resolution. To enable incorporation of hourly time series by HRU, the contractor shall rerun the existing New England SWAT and Susquehanna HSPF models (based on existing calibrations) configured to allow the HRU-specific time series to be saved at an hourly time step. To facilitate future use of model output in the WMOST water quality module under development, the contractor shall also save loading time series for nitrogen, phosphorus, and total suspended solids. EPA will provide all model input data files required. To accommodate space constraints in EPA's Science Inventory (in which WMOST products are released to the public), EPA will also develop an alternative strategy for providing pre-processed model output files to prospective users using EPA's existing Estuary Data Mapper (EDM) application (www2.epa.gov/edm) for environmental data retrieval over the internet. EDM provides a virtual portal for downloading time series as shapefiles (with accompanying tab-delimited text file) based on a user-specified query based on location and time interval of interest. EDM can also be used to generate a Representational State Transfer (REST) url that will retrieve the equivalent dataset without using the visual interface.

Only HSPF model outputs have been incorporated into the WMOST data library to date. Typically HSPF models are based on 10-20 HRUs within a given subbasin based on unique combinations of land-use and soils. In contrast, SWAT models are typically calibrated with more finely defined HRUs (e.g., land-use, soils, and slope) so a given model may have hundreds or thousands of HRUs defined. The large number of unique HRUs in SWAT models will be unmanageable. In consultation with the WACOR, the contractor shall propose an approach for reducing the number of SWAT HRUs to a manageable set (e.g., a number of HRUs comparable to the number of HRUs in an HSPF model). For example, this could include aggregating HRUs to comparable combinations of land-use and soils. The ability to aggregate model outputs across HRUs shall also be included as an option in the pre-processor.

In the future, EPA intends to include additional output from the full collection of HSPF and SWAT results from ORD's 20 Watersheds project, with an exploration of the feasibility of incorporating other similar output data from studies carried out by USGS, the Bureau of Reclamation, and others as a follow-on step. Overall, building this capability will allow WMOST to leverage the growing archive watershed of climate impacts assessments, performed using the leading hydrology models, and developed for other purposes, for decision analytic applications requiring consideration of a wide range of climate scenarios (e.g., Robust Decision Making-style analyses[3]).

3 http://www.rand.org/pubs/research_reports/RR720.html

In addition, the contractor shall develop, in close consultation with ORD technical experts, a preliminary, experimental version of a 'climate screening interface' for WMOST that would facilitate the production of a series of WMOST runs that span a range of climate futures. This interface would allow the user to specify a sequence of runs that would create a range of WMOST outputs corresponding to different climate/hydrology futures, driven by the kinds of archived hydrologic model results described above. Another key aspect of this capability would be to facilitate display of results from said sequence of runs in a way that would allow the user to develop insight into climate impacts on their system of interest, e.g., the impacts of climate change on the performance of a specific BMP under multiple scenarios of future climate change. This functionality would entail running multiple climate scenarios from either the WMOST dataset or user-supplied datasets of runoff, recharge, precipitation, and temperature time series with a fixed set of management options rather than optimizing management solutions for each climate scenario. The fixed set of management options would be specified by the user either based on the user's preference or based on an initial optimization run for baseline conditions.

Finally, the contractor shall apply the enhanced hydrologic model inputs and climate screening capabilities, driven by HSPF/SWAT outputs from the 20 Watersheds project, in one or more case studies for which WMOST simulations are already planned (e.g., as per Task 4 above). The purpose of this case study work would be to demonstrate the applicability of the enhanced WMOST model for 'stress testing' specific BMPs across a range of plausible future climate conditions.

Deliverables and schedule under Task 8 (due dates listed or modified by written technical direction).

The following deliverables are anticipated for Option Period 3 of this work assignment:
8a. Draft updated WMOST v.2.2 tool with enhanced hydrology module capabilities including HSPF and SWAT model preprocessors (August 31, 2016).
8b. WMOST v2.2 tool with climate screening interface revised in response to EPA internal review comments (August 31, 2016)
8c. Case study application WMOST files with results (September 30, 2016)
8d. Revised case study application files in response to EPA internal review comments (October 31, 2016)

Task 9 Test compatibility of WMOST with MS Office Excel 2016 and update as needed

The contractor shall test compatibility of WMOST v3 modules and subsequent versions for compatibility with MS Office Excel 2016 (pending US EPA planned upgrades in October 2016 and technical direction from the WACOR) using case study data from previous analyses performed with MS Excel 2013. Errors, resolution of errors related to code changes in Excel Visual Basic, and effects on backward compatibility (to Excel 2013) shall be reported to EPA. WMOST v3 and associated case study files shall be updated to be compatible with MS Excel 2016.

Deliverables and schedule under Task 9 (due dates listed or modified by written technical direction).

9a. Memo documenting compatibility testing of WMOST v 2.2 and v3 with MS Excel 2016 (Coincident with delivery of WMOST v3).

Task 10. Data Library Enhancements to Hydrology and Flood Module (Contract PWS Sections A,B)

Functionality of the existing Hydrology module will be extended to allow incorporation of Hydrological Simulation Program (HSPF) and (possibly) Soil and Water Assessment Tool (SWAT) model outputs to be made available for download through US EPA's Estuary Data Mapper application (www2.epa.gov/edm). These will include current and historic runoff and recharge time series for New England HSPF models already in the WMOST v2 Supplemental Files, current and historic runoff and recharge time series from two additional New England HSPF models: Charles River watershed and Farmington sub-basin from the CT Watershed Model, 2-4 future climate scenario time series for each of the New England HSPF models (to be developed through an interagency agreement with USGS), and current/historic model outputs from the USGS/EPA Chesapeake Bay Watershed Model 6.1 (beta). Options for including ancillary hydrology model data needed as WMOST inputs shall be assessed: Groundwater recession coefficients (Interflow Recession Parameter (IRC) and Active Groundwater Recession Constant (AGWRC)), Infiltration Parameter (INFILT), Interflow (INTFW), and Effective Impervious Area, normally available from the HSPF model User Control Input (UCI) files. In addition, best options for making geospatial information for HRU distributions available for use in WMOST will be assessed. For example, ancillary hydrology model parameters and HRU distributions could either be made available through EPA's EDM application for download or included as Supplemental Files packaged with WMOST. Currently, downloads of shapefiles by the user using EDM include an associated tab-delimited ASCII file with attributes (e.g., time series). Finally, options for delivering and importing pre-processed flooding risk curve tables should be assessed.

Deliverables and schedule under Task 10 (due dates listed or modified by written technical direction).

10a. Modified hydrology module to allow import of hydrology time series files downloaded via EPA Estuary Data Mapper application (September 30, 2016)
10b. Modified flooding module to allow import of pre-processed flooding cost curves (September 30, 2016)

Task 11. WMOST workshop (Contract PWS Section D)

Training materials for WMOST v2 were produced and presented at a one-day workshop which was held at US EPA Region 1 in Boston, with a concurrent session at University of Rhode Island – Kingston on June 8, 2016. The lectures associated with this workshop are being recorded by EPA for future dissemination and use. Transcripts of the videos from the workshop shall be produced using automated software and subsequently edited for accuracy. Final scripts will be

provided in .srt format so that videos can be posted on EPA's YouTube account for access by EPA web sites.

EPA has received approval for a proposal to present workshop materials (or a reduced subset) at a pre-conference workshop at the International Low Impact Development Conference (August 29-31, 2016) in Portland, Maine. This event is contingent on sufficient registration by participants. Because the workshop registrations and room arrangements will be handled by the conference organizers we do not anticipate additional preparation for this workshop by the contractor.

EPA currently requires the completion of EPA Form 5170 with signed approvals for EPA-sponsored conferences for which combined EPA expenses on conference support and associated travel will exceed $20,000. Given the location of this workshop, EPA does not anticipate that the $20K threshold will be exceeded for the August training workshop, however, if the contactor determines that the cost will exceed the $20,000 it shall stop work until it receives approval from the EPA CO.

Deliverables and schedule under Task 11 (due dates listed or modified by written technical direction).

11a. Automated creation of transcript from recorded videos from WMOST training workshop held on July 8 with subsequent manual edits and conversion to .srt caption file (September 30, 2016)
11b. WMOST training workshop presentation at International Low Impact Development Conference in Portland, ME (August 29, 2016)

Task 12. Sewer Overflow Module (Contract PWS Sections A, B)

The goal of this task is to create a new Combined Sewer Overflow (CSO) Reduction module for WMOST designed to be compatible with EPA's LTCP-EZ[4] template calculations. The Green LTCP-EZ Template consists of FORM GREEN LTCP-EZ and related schedules and instructions. It provides a starting place and a framework for small communities to organize and analyze basic information that is central to effective CSO control planning. Schedule 4 – CSO VOLUME provides a process for assessing CSO control needs under the *presumption approach* of the CSO Control Policy. It allows the permittee or other user (the term *permittee* will be used throughout this document, but the term should be interpreted to include any users of the Green LTCP-EZ Template) to estimate a target volume of combined sewage that needs to be stored, treated, or eliminated. Schedules 5A and 5B– CSO RUNOFF, NETWORK AND WWTP CONTROLS enable the permittee to evaluate the ability of a number of widely used green infrastructure runoff controls and pipe network CSO controls to meet the reduction target. FORM GREEN LTCP-EZ and its schedules are available in hard copy format or as computer-based spreadsheets. The contractor shall produce a module which either directly imports information from the applicable portions of the FORM GREEN LTCP-EZ schedules or which reproduces the calculations used to establish CSO control needs under the presumption approach of the CSO control policy, the

4 http://www.epa.gov/green-infrastructure/epas-green-long-term-control-ez-template

estimation of a target volume of combined sewage that needs to be stored, treated, or eliminated, and the ability of a number of widely used green infrastructure runoff controls and pipe network CSO controls to meet the reduction target. The contractor shall add these CSO control options to the suite of available management options in WMOST and shall add the capability of including CSO reduction targets as a constraint in WMOST.

Deliverables and schedule under Task 12 (due dates listed or modified by written technical direction)

12a. Technical memo outlining approach for CSO module (August 31, 2016)

12b. Revised technical memo outlining approach for CSO module (Within 2 weeks following receipt of EPA comments from EPA WACOR)

12c. Draft CSO module (October 31, 2016)

12d. Revised CSO module (Within 2 weeks following receipt of EPA comments from EPA WACOR)

Task 13. Additional WMOST Case Studies (Contract PWS Sections B, D)

The contractor shall provide up to 367 hours of technical support for additional WMOST case studies which may include a combination of water quantity- and water quality related goalsSupport shall include providing overviews of WMOST functionality to stakeholders, assisting stakeholders with problem formulation, evaluating sources of input data for WMOST case studies, potential modifications to existing WMOST modules to facilitate use of regional datasets (e.g., BMP parameters for California), assistance in setting up WMOST optimization runs, and interpretation of results. Based on initial discussions with stakeholders, EPA anticipates that one or more case studies will be identified from the following or other sources:

1) Chesapeake Bay community – Maryland Department of Environment (MDE) is interested in evaluating the utility and compatibility of WMOST to support the Phase II Watershed Implementation Plans which in turn support the Chesapeake Bay Total Maximum Daily Load (TMDL) process. MDE is working on identifying a suitable community to serve as a case study. Chesapeake Bay Program Office has provided hydrology time series data from the Chesapeake Bay Watershed Model v. 6 to serve as inputs to WMOST version 2.

2) Campus-Community Partnerships – EPA has had preliminary discussions with representatives of California academic institutions interested in applying EPA tools as part of the Campus-Community Partnerships for Sustainability Program. California State University at Fullerton has expressed interest in applying WMOST in development of their stormwater management plan. This work could be coordinated with the LID Sizing Tool for California's Phase II permit (http://www.owp.csus.edu/research/software-tools.php). Developers of the LID Sizing Tool for California have created a series of input parameters for SWMM suitable for describing performance of stormwater BMPs across the state of

California.

3) Region 7 Communities – Region 7 has expressed interest in exploring the application of WMOST to promote community resilience in the face of drought.

4) Making a Visible Difference (MVD) Communities – EPA-Office of Research and Development has discussed the possibility of providing support to one of the MVD communities identified by the EPA Regions for targeted support. In particular, EPA Region 3 has 5 MVD communities with an interest in green infrastructure solutions: Dover, DE, Huntington, WV, Newport News, VA, Norfolk, VA, Reading, PA and EPA Region 6 has one MVD community, Brownsville, TX, which has expressed interest.

5) Expansion of WMOST application to entire Taunton River watershed (moving from headwater basins downstream) through collaboration with Southern New England Coastal Watershed Restoration (SNECWR) grantees

Deliverables and schedule under Task 13 (due dates listed or modified by written technical direction)

13a. Provide overviews of WMOST functionality to stakeholders (within 2 weeks following technical direction by EPA WACOR)

13b. Participate in conference calls or AdobeConnect webinars set up by EPA with stakeholders to discuss problem formulation process for setting up WMOST case studies (within 2 weeks following technical direction by EPA WACOR)

13c. Provide assistance and guidance to stakeholders in setting up case studies with WMOST v2 and/or WMOST v3 beta during EPA-scheduled conference calls (to be determined (TBD) based on technical direction from EPA WACOR)

13d. Provide assistance with WMOST optimization runs for case studies (TBD based on technical direction from EPA WACOR)

13e. Provide assistance with interpretation of WMOST output for case studies in the form of technical memo (TBD based on technical direction from EPA WACOR)

EPA

United States Environmental Protection Agency
Washington, DC 20460

Work Assignment

Work Assignment Number: 3-07

☐ Other ☐ Amendment Number:

Contract Number	Contract Period	Title of Work Assignment/SF Site Name
EP-C-13-039	09/11/2013 To 07/31/2017	Enhancements to WMOST
	Base Option Period Number 3	

Contractor	Specify Section and paragraph of Contract SOW
ABT ASSOCIATES INC.	A2.1,A2.2,A2.3,A3,A6,B1,C1,C7,D1,D2,G

Purpose:
- [X] Work Assignment
- [ ] Work Assignment Amendment
- [X] Work Plan Approval
- [ ] Work Assignment Close-Out
- [ ] Incremental Funding

Period of Performance: From 08/01/2016 To 07/31/2017

Comments:

☐ Superfund — Accounting and Appropriations Data — [X] Non-Superfund

Note: To report additional accounting and appropriations date use EPA Form 1900-69A.

SFO (*Max 2*): ☐

Line	DCN (Max 6)	Budget/FY (Max 4)	Appropriation Code (Max 6)	Budget Org/Code (Max 7)	Program Element (Max 9)	Object Class (Max 4)	Amount (Dollars)	(Cents)	Site/Project (Max 8)	Cost Org/Code
1										
2										
3										
4										
5										

Authorized Work Assignment Ceiling

	Cost/Fee	LOE
Contract Period: 09/11/2013 To 07/31/2017	$0.00	0
This Action:	$137,095.00	1,409
Total:	$137,095.00	1,409

Work Plan / Cost Estimate Approvals

	Cost/Fee	LOE
Contractor WP Dated: 08/16/2016	$137,095.00	1,409
Cumulative Approved:	$137,095.00	1,409

Work Assignment Manager Name: Naomi Detenbeck	Branch/Mail Code:
(Signature) (Date)	Phone Number: 401-782-3162
	FAX Number:
Project Officer Name: Ahmar Siddiqui	Branch/Mail Code:
(Signature) (Date)	Phone Number: 202-566-1044
	FAX Number:
Other Agency Official Name	Branch/Mail Code:
(Signature) (Date)	Phone Number:
	FAX Number:
Contracting Official Name: Tammy Adams	Branch/Mail Code:
TAMMY ADAMS — Digitally signed by TAMMY ADAMS DN: c=US, o=U.S. Government, ou=USEPA, ou=Staff, cn=TAMMY ADAMS, dnQualifier=0000018417 Date: 2016.08.29 11:18:58 -04'00'	Phone Number: 513-487-2030
(Signature) (Date)	FAX Number: 513-487-2545

EPA

United States Environmental Protection Agency
Washington, DC 20460

Work Assignment

Work Assignment Number: 3-07

☐ Other ☒ Amendment Number: 000001

Contract Number	Contract Period	Title of Work Assignment/SF Site Name
EP-C-13-039	09/11/2013 To 07/31/2017	Enhancements to WMOST
	Base Option Period Number 3	

Contractor	Specify Section and paragraph of Contract SOW
ABT ASSOCIATES INC.	PWS sections A2.1,A2.2,A2.3,A3,A6,B1,C1,C7,D1,D2,G

Purpose:
- ☐ Work Assignment
- ☒ Work Assignment Amendment
- ☐ Work Plan Approval
- ☐ Work Assignment Close-Out
- ☐ Incremental Funding

Period of Performance: From 10/05/2016 To 07/31/2017

Comments: Please provide a revised cost estimate within 15 calendar days of receipt of the work assignment (WA) Amendment 1. A work plan is not required.

☐ Superfund — Accounting and Appropriations Data — ☒ Non-Superfund

SFO (*Max 2*) ☐

Note: To report additional accounting and appropriations date use EPA Form 1900-69A.

Line	DCN (Max 6)	Budget/FY (Max 4)	Appropriation Code (Max 6)	Budget Org/Code (Max 7)	Program Element (Max 9)	Object Class (Max 4)	Amount (Dollars)	(Cents)	Site/Project (Max 8)	Cost Org/Code
1										
2										
3										
4										
5										

Authorized Work Assignment Ceiling

	Cost/Fee	LOE
Contract Period: 09/11/2013 To 07/31/2017		1,409
This Action:		823
Total:		2,232

Work Plan / Cost Estimate Approvals

	Cost/Fee	LOE
Contractor WP Dated:		
Cumulative Approved:		

Work Assignment Manager Name: Naomi Detenbeck (Signature) (Date)	Branch/Mail Code:	
	Phone Number:	401-782-3162
	FAX Number:	
Project Officer Name: Ahmar Siddiqui (Signature) (Date)	Branch/Mail Code:	
	Phone Number:	202-566-1044
	FAX Number:	
Other Agency Official Name (Signature) (Date)	Branch/Mail Code:	
	Phone Number:	
	FAX Number:	
Contracting Official Name: Tammy Adams TAMMY ADAMS Digitally signed by TAMMY ADAMS DN: c=US, o=U.S. Government, ou=USEPA, ou=Staff, cn=TAMMY ADAMS, dnQualifier=0000018417 Date: 2016.10.05 10:05:18 -04'00' (Signature) (Date)	Branch/Mail Code:	
	Phone Number:	513-487-2030
	FAX Number:	513-487-2545

WORK ASSIGNMENT

I. Title: ENHANCEMENTS TO THE WATERSHED MANAGEMENT OPTIMIZATION SUPPORT TOOL (WMOST)

Contractor: Abt Associates **Contract No.:** EP-C-13-039

II. Work Assignment Number: 3-07 Amendment 1

III. Estimated Period of Performance: Date of issuance through July 31, 2017

IV. Estimated Level of Effort: 823

V. Key EPA Personnel:

Work Assignment Contracting Officer's Representative (WACOR):

Naomi Detenbeck
US EPA Atlantic Ecology Division
27 Tarzwell Drive
Narragansett, RI 02882
401/782-3162
401/782-3030 (fax)

Alternate Work Assignment Contracting Officer's Representative (Alt WACOR):

Marilyn ten Brink
US EPA Atlantic Ecology Division
27 Tarzwell Drive
Narragansett, RI 02882
401/782-3078
401/782-3030 (fax)

This amendment increases the level of technical support on Task 13. Task 13 has been revised as follows.

Please provide a revised cost estimate within 15 calendar days of receipt of the work assignment (WA) Amendment 1. A work plan is not required.

Task 13. Additional WMOST Case Studies – updated (Contract PWS Sections B, D)

This amendment increases the level of technical support for case studies by 823 hours from the original level of 367 hours. The contractor shall provide up to 1190 hours of technical support for additional WMOST case studies which may include a combination of water quantity- and water quality related goals. Support shall include providing overviews of WMOST functionality to stakeholders, assisting stakeholders with problem formulation, evaluating sources of input data for

WMOST case studies, potential modifications to existing WMOST modules to facilitate use of regional datasets (e.g., addition of new BMPs to stormwater BMP module), assistance in setting up WMOST optimization runs, and interpretation of results. Based on initial discussions with stakeholders, EPA anticipates that one or more case studies will be identified from the following or other sources:

1) Community in Mystic River, CT watershed or associated with Pioneer Valley Planning Commission region in Massachusetts – This case study will provide an opportunity to test the new CSO module. Work will be coordinated with ongoing work in these communities on collaborative learning, regional planning and training.

2) Chesapeake Bay community – Maryland Department of Environment (MDE) is interested in evaluating the utility and compatibility of WMOST to support the Phase II Watershed Implementation Plans which in turn support the Chesapeake Bay Total Maximum Daily Load (TMDL) process. MDE is working on identifying a suitable community to serve as a case study. Chesapeake Bay Program Office has provided hydrology time series data from the Chesapeake Bay Watershed Model v. 6 to serve as inputs to WMOST version 2.

3) Region 7 Communities – Region 7 has expressed interest in exploring the application of WMOST to promote community resilience in the face of drought and to evaluate the cost-effectiveness of BMPs in a mixed land-use subwatershed of the Middle Kansas River under varying climate conditions.

4) Making a Visible Difference (MVD) Communities – EPA-Office of Research and Development has discussed the possibility of providing support to one of the MVD communities identified by the EPA Regions for targeted support. In particular, EPA Region 3 has 5 MVD communities with an interest in green infrastructure solutions: Dover, DE, Huntington, WV, Newport News, VA, Norfolk, VA, Reading, PA and EPA Region 6 has one MVD community, Brownsville, TX, which has expressed interest.

5) Expansion of WMOST application to three HUC12s in the Taunton River watershed (moving from headwater basins downstream) through collaboration with Southern New England Coastal Watershed Restoration (SNECWR) grantees.

Deliverables and schedule under Task 13 (due dates listed or modified by written technical direction)

13a. Provide overviews of WMOST functionality to stakeholders (within 2 weeks following technical direction by EPA WACOR)

13b. Participate in conference calls or AdobeConnect webinars set up by EPA with stakeholders to discuss problem formulation process for setting up WMOST case studies (within 2 weeks following technical direction by EPA WACOR)

13c. Provide assistance and guidance to stakeholders in setting up case studies with

WMOST v2 and/or WMOST v3 beta during EPA-scheduled conference calls (to be determined (TBD) based on technical direction from EPA WACOR)

13d. Provide assistance with WMOST optimization runs for case studies (TBD based on technical direction from EPA WACOR)

13e. Provide assistance with interpretation of WMOST output for case studies in the form of technical memo (TBD based on technical direction from EPA WACOR)

EPA

United States Environmental Protection Agency
Washington, DC 20460

Work Assignment

Work Assignment Number: 3-07

☐ Other ☒ Amendment Number: 000001

Contract Number	Contract Period	Title of Work Assignment/SF Site Name
EP-C-13-039	09/11/2013 To 07/31/2017 Base Option Period Number 3	ENHANCEMENTS TO WMOST

Contractor: ABT ASSOCIATES INC.

Specify Section and paragraph of Contract SOW: A2.1, A2.2, A2.3, A3, A5, B1, C1, C7, D1, D2, G

Purpose:
- ☐ Work Assignment
- ☒ Work Assignment Amendment
- ☒ Work Plan Approval
- ☐ Work Assignment Close-Out
- ☐ Incremental Funding

Period of Performance: From 10/05/2016 To 07/31/2017

Comments:

☐ Superfund — Accounting and Appropriations Data — ☒ Non-Superfund

Note: To report additional accounting and appropriations date use EPA Form 1900-69A.

SFO (*Max 2*) ☐

Line	DCN (Max 6)	Budget/FY (Max 4)	Appropriation Code (Max 6)	Budget Org/Code (Max 7)	Program Element (Max 9)	Object Class (Max 4)	Amount (Dollars)	(Cents)	Site/Project (Max 8)	Cost Org/Code
1										
2										
3										
4										
5										

Authorized Work Assignment Ceiling

	Cost/Fee	LOE
Contract Period: 09/11/2013 To 07/31/2017	$137,095.00	1409
This Action:	$85,645.00	823
Total:	$222,740.00	2,232

Work Plan / Cost Estimate Approvals

	Cost/Fee	LOE
Contractor WP Dated: 10/19/2016	$85,645.00	823
Cumulative Approved:	$222,740.00	2,232

Work Assignment Manager Name: Naomi Detenbeck (Signature) (Date)	Branch/Mail Code: Phone Number: 401-782-3162 FAX Number:
Project Officer Name: Ahmar Siddiqui (Signature) (Date)	Branch/Mail Code: Phone Number: 202-566-1044 FAX Number:
Other Agency Official Name (Signature) (Date)	Branch/Mail Code: Phone Number: FAX Number:
Contracting Official Name: Tammy Adams TAMMY ADAMS Digitally signed by TAMMY ADAMS DN: c=US, o=U.S. Government, ou=USEPA, ou=Staff, cn=TAMMY ADAMS, dnQualifier=0000018417 Date: 2016.11.01 07:35:49 -04'00' (Signature) (Date)	Branch/Mail Code: Phone Number: 513-487-2030 FAX Number: 513-487-2545

EPA

United States Environmental Protection Agency
Washington, DC 20460

Work Assignment

Work Assignment Number: 3-07

☐ Other ☒ Amendment Number: 000002

Contract Number	Contract Period	Title of Work Assignment/SF Site Name
EP-C-13-039	09/11/2013 To 07/31/2017 Base Option Period Number 3	Enhancements to WMOST

Contractor: ABT ASSOCIATES INC.

Specify Section and paragraph of Contract SOW: Sections A2.1,A2.2,A2.3,A3,A6,B1,C1,C7,D1,D2,G

Purpose:
- ☐ Work Assignment
- ☒ Work Assignment Amendment
- ☐ Work Plan Approval
- ☐ Work Assignment Close-Out
- ☐ Incremental Funding

Period of Performance: From 12/08/2016 To 07/31/2017

Comments:

☐ Superfund — Accounting and Appropriations Data — ☒ Non-Superfund

Note: To report additional accounting and appropriations date use EPA Form 1900-69A.

SFO (*Max 2*) ☐

Line	DCN (Max 6)	Budget/FY (Max 4)	Appropriation Code (Max 6)	Budget Org/Code (Max 7)	Program Element (Max 9)	Object Class (Max 4)	Amount (Dollars)	(Cents)	Site/Project (Max 8)	Cost Org/Code
1										
2										
3										
4										
5										

Authorized Work Assignment Ceiling

	Cost/Fee	LOE
Contract Period: 09/11/2013 To 07/31/2017	$222,740.00	2,232
This Action:		1,351
Total:	$222,740.00	3,583

Work Plan / Cost Estimate Approvals

	Cost/Fee	LOE
Contractor WP Dated:		
Cumulative Approved:	$222,740.00	3,583

Work Assignment Manager Name: Naomi Detenbeck
(Signature) (Date)
Branch/Mail Code:
Phone Number: 401-782-3162
FAX Number:

Project Officer Name: Ahmar Siddiqui
(Signature) (Date)
Branch/Mail Code:
Phone Number: 202-566-1044
FAX Number:

Other Agency Official Name:
(Signature) (Date)
Branch/Mail Code:
Phone Number:
FAX Number:

Contracting Official Name: Tammy Adams
TAMMY ADAMS
Digitally signed by TAMMY ADAMS
DN: c=US, o=U.S. Government, ou=USEPA, ou=Staff, cn=TAMMY ADAMS, dnQualifier=0000018417
Date: 2016.12.08 15:29:56 -05'00'
(Signature) (Date)
Branch/Mail Code:
Phone Number: 513-487-2030
FAX Number: 513-487-2545

WORK ASSIGNMENT

I. Title: ENHANCEMENTS TO THE WATERSHED MANAGEMENT OPTIMIZATION SUPPORT TOOL (WMOST)

Contractor: Abt Associates **Contract No.:** EP-C-13-039

II. Work Assignment Number: 3-07 Amendment 2

III. Estimated Period of Performance: From date of issuance through July 31, 2017

IV. Estimated Level of Effort: 1351 additional hours (320 of these are no-cost)

V. Key EPA Personnel:

Work Assignment Contracting Officer's Representative (WACOR):

Naomi Detenbeck
US EPA Atlantic Ecology Division
27 Tarzwell Drive
Narragansett, RI 02882
401/782-3162
401/782-3030 (fax)

Alternate Work Assignment Contracting Officer's Representative (Alt WACOR):

Marilyn ten Brink
US EPA Atlantic Ecology Division
27 Tarzwell Drive
Narragansett, RI 02882
401/782-3078
401/782-3030 (fax)

VI. Background and Purpose:

The 1972 Clean Water Act (CWA) directs the Environmental Protection Agency (EPA) to develop national technology-based regulations for categories of industries that discharge pollutants directly to surface waters (effluent guidelines) or that discharge pollutants indirectly through sewage treatment plants (pretreatment standards). The CWA also directs EPA to develop national technology-based regulations for new industrial facilities (new source performance standards).

Under Executive Orders 12866 and 13563, EPA is required to estimate the potential benefits and costs to society. As such, the purpose of this Work Assignment (WA) is to update the EPA-supported Watershed Management Optimization Support Tool (WMOST v. 1, v. 2, v. 2.1 and v. 3; US EPA 2013a,b; 2015, 2016) for use in Integrated Planning (http://water.epa.gov/infrastructure/greeninfrastructure/upload/memointegratedmunicipalplans.p

df) and Integrated Water Resources Management (IWRM; Zoltay 2007, Zoltay et al. 2010).

The purpose of this amendment is to add resources to existing task 8 (climate tools) and task 13 (case studies).

Under Tasks 8 and 13, EPA plans to add functionality to WMOST to allow users to evaluate the effect of management options under various climate change scenarios to support robust decision-making. The WMOST software is a contract deliverable and is being provided to EPA with "unlimited rights," as that term is defined in FAR 52.227-14(a) (1987). Under a robust decision-making (RDM) approach, the outcome of a prescribed management strategy can be "stress-tested" against various climate change scenarios to determine under what potential future climates it will fail. The prescribed management strategy could be a predetermined choice such as a Watershed Implementation Plan to meet Total Maximum Daily Load (TMDL) requirements, or it could be an optimal suite of management options determined by a tool such as WMOST to meet management targets and constraints at least cost under the current climate regime. The following sequence of operations is envisioned in a standardized RDM protocol:

Determine optimum least-cost management solution to meet management targets and constraints given current climate or Identify pre-determined management solution for RDM testing

↓

Identify range of climate change scenarios for testing

a) Choose delta (Δ) Temperature (Temp) and Δ Precipitation (Prec) values based on biplot of predicted Δ Temp vs. Δ Prec from Coupled Model Intercomparison Project Phase 5 (CMIP5) climate change model runs for selected emission scenario including average or median and points along bounding envelope
b) Subsample space inside bounding envelope of biplot of Δ Temp x Δ Prec to generate a set of delta values to use to modify existing precipitation and temperature time series

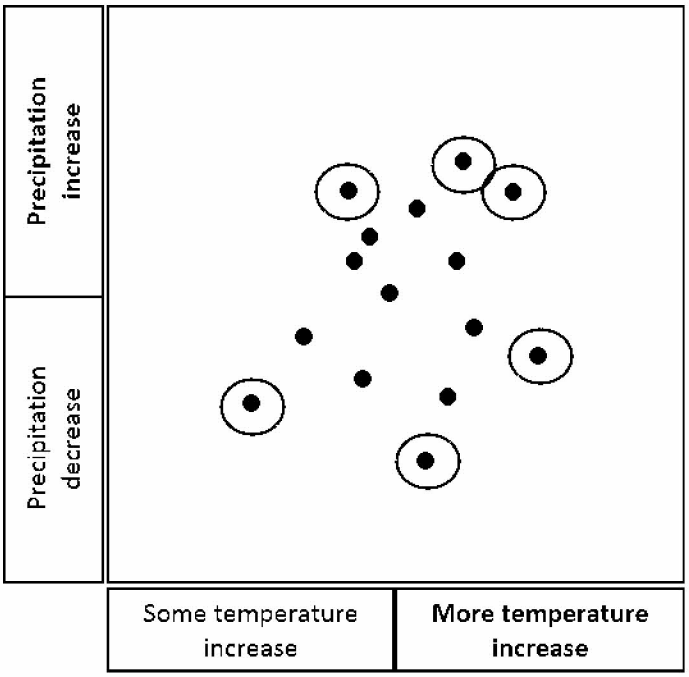

Figure 1. A theoretical scatterplot showing a range of projections for precipitation and temperature. Black dots are individual climate change projections. The outermost projections are circled in green, and make up a boundary encapsulating the entire range of the ensemble. This can be a quick and useful method for making robust selections of ensemble members.

Generate multiple input time series (unit runoff and recharge, loads) based on climate change scenarios

↓

Run multiple simulations in WMOST with fixed management regime using generated input time series

↓

Identify combinations of Δ Temp x Δ Prec at which prescribed management regime does not meet specified targets/constraints at which prescribed management regime does not meet specified targets/constraints. End of stress-testing phase.

Generate new strategies that might perform better under climate futures: Run WMOST in optimization mode at minimum Δ Temp x Δ Prec points at which prescribed initial solution failed

↓

Identify differences in initial prescribed management option and new solutions at failure points to define management option gradients

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↓

Sensitivity analysis: Run WMOST in simulation mode along combined gradient of management options and climate change scenarios (from initial point to failure points) to determine most robust solution

A number of additional functions are required to facilitate routine application of the RDM protocol using WMOST:

1) Running batch simulations of Storm Water Management Model (SWMM) to generate multiple input time series for WMOST (If water quality loads are available from prior Hydrological Simulation Program – Fortran (HSPF) or Soil and Water Assessment Tool (SWAT) models, proceed with item 2.)
2) Running batch simulations of a chosen WMOST management scenario with multiple time series inputs representing different climate regimes
3) Sensitivity analysis of WMOST solutions to varying management inputs along climate gradients

In addition, the RDM process using these functions needs to be tested using existing case studies.

Under this work assignment the contractor shall conduct all analyses requiring the collection and manipulation of data and models in accordance with the EPA approved quality assurance (QA) project plan (QAPP) that will be based on Task 2 QAPP language. The QAPP shall describe the procedures for assuring the quality of the primary and secondary environmental and economic data used for this work assignment.

In carrying out the tasks specified in this work assignment, the contractor may be called upon to build upon and continue work performed under WA 6-32 and 5-32 under the Contract EP-C-07-023, and work assignments 1-07 and 2-07 under the current Contract EP-C-13-039. The work performed under this work assignment will not duplicate work conducted under the previous work assignments.

References cited in Background

U.S. EPA. 2013a. Watershed Management Optimization Support Tool (WMOST) v1: Theoretical Documentation. US EPA Office of Research and Development, Washington, DC, EPA/600/R-13/151, 2013.

U.S. EPA. 2013b. Watershed Management Optimization Support Tool (WMOST) v1: User Manual and Case Study Examples. US EPA Office of Research and Development, Washington, DC, EPA/600/R-13/174, 2013.

U.S. EPA. 2015. Watershed Management Optimization Support Tool (WMOST) v2: Theoretical Documentation. US EPA Office of Research and Development, Washington, DC, EPA/600/R-15/058.

U.S. EPA. 2016. Watershed Management Optimization Support Tool (WMOST) v2: User Manual and Case Study Examples. US EPA Office of Research and Development, Washington, DC, EPA/600/R-15/059.

Zoltay, V.I. 2007. Integrated watershed management modeling: Optimal decision making for

natural and human components. M.S. Thesis, Tufts Univ., Medford, MA.

Zoltay, V.I., R.M. Vogel, P.H. Kirshen, and K.S. Westphal. 2010. Integrated watershed management modeling: Generic optimization model applied to the Ipswich River Basin. Journal of Water Resources Planning and Management.

Task 1 - Prepare Work Plan

The contractor shall prepare a work plan within 15 calendar days of receipt of the WA. The work plan shall outline, describe and include the technical approach, resources, timeline and due dates for deliverables, a detailed cost estimate by task, and a staffing plan. The EPA WACOR, the CL-COR and the Contracting Officer (CO) will review the work plan. However, only the CO can approve/disapprove, suggest revisions, or change the work plan. Official revisions will be given to the contractor by the CO. The contractor shall prepare a revised work plan incorporating the Contracting Officer's comments, if required.

A biweekly update call with the EPA WACOR will be required for this work assignment to discuss progress on deliverables, costs, and other potential issues.

Deliverables and schedule under Task 1

1a. Work plan within 15 calendar days of receipt of work assignment.

Task 8 – Enhancement of automated hydrologic time series capability in WMOST v.2 and development of climate screening interface for use with WMOST v.2 (due dates listed or modified by written technical direction). (Contract PWS Sections A, B)

This task is being amended to add additional items:

The contractor shall develop a tool to run batch simulations of SWMM to generate multiple input time series for WMOST, including recharge, runoff, and water quality loads (nitrogen, phosphorus, suspended solids, zinc). The contractor and EPA agree that the software that is developed under the work assignment (WMOST v.1-3 and associated tools), including the original software developed by Viktoria Zoltay which is being modified and incorporated into the WMOST versions, is a contract deliverable and is being provided to EPA with "unlimited rights," as that term is defined in FAR 52.227-14(a) (1987).

Additional deliverables and schedule under Task 8 (due dates listed or modified by written technical direction)

8e. Draft technical memo on approach for automating time series tool in batch mode – 5 working days after work plan approval

8f. Final technical memo on approach for automating time series tool in batch mode – 5 working days after receipt of comments by EPA regarding draft memo

8g. Add capability to run previously developed automated time series tool in batch mode – 45 days after EPA approval of final technical memo
8h. Draft Technical memo describing approach for tool to run batch simulations of SWMM – December 29, 2016
8i. Final Technical memo describing approach for tool to run batch simulations of SWMM – 5 working days after receipt of EPA comments
8j. Draft module/tool to run batch simulations of SWMM with documentation – February 15, 2017
8k. Final module/tool to run batch simulations of SWMM with documentation including documented original code– February 28, 2017

Task 13. Additional WMOST Case Studies – updated (Contract PWS Sections B, D)

The original task is being revised to add no-cost hours for the case studies. In addition, new tasks have been added beyond what was in Amendment 1.

This amendment increases the level of technical support for case studies by 733 cost hours plus 320 no-cost hours (total of 1053 hours) from the previous level of 1190 hours. The additional no-cost hours are based on a re-assessment of the types of effort required for processing data and implementing model changes for the original case studies. The previous work required relatively greater involvement of mid-level staff and programmers to complete tasks cost-effectively as compared to original budget assumptions.

The contractor shall add functionality to WMOST to support an RDM case study, including:
1) Enabling batch simulation runs with multiple time series inputs, and
2) Enabling batch simulation runs to perform sensitivity analyses.

The contractor and EPA agree that the software that is developed under the work assignment (WMOST v.1-3), including the original software developed by Viktoria Zoltay which is being modified and incorporated into the WMOST versions, is a contract deliverable and is being provided to EPA with "unlimited rights," as that term is defined in FAR 52.227-14(a) (1987). Finally, the contractor shall provide up to 200 hours of technical support to demonstrate climate change modules described under Task 8 and above using one or more of the existing Taunton River watershed case studies (Monponsett Ponds, Wading River/ThreeMile River/Mill River) or one of the impoundments in the Patuxent River watershed that has a phosphorus TMDL (e.g., Rocky Gorge Reservoir, Triadelphia Reservoir).

Additional deliverables and schedule under Task 13 (due dates listed or modified by written technical direction)

13f. Draft Technical memo addressing approach for batch simulation runs (items 1 and 2 above) – 10 working days after technical direction of WACOR

13g. Final Technical memo addressing approach for batch simulation runs – 5 working days after receipt of EPA comments

13h. Draft module/tool to enable batch simulation runs with multiple time series inputs with documentation– 20 working days after final technical memo approval

13i. Final module/tool to enable batch simulation runs with multiple time series inputs with documentation including documented code – 10 working days after receipt of EPA comments

13j. Draft Technical memo addressing approach for sensitivity analysis tool – 10 working days after technical direction of WACOR

13k. Final Technical memo addressing approach for sensitivity analysis tool – 5 working days after receipt of EPA comments

13l. Draft module/tool to perform sensitivity analyses with documentation– 20 working days after final technical memo approval

13m. Final module/tool to perform sensitivity analyses with documentation including documented code – 10 working days after receipt of EPA comments

13n. Draft technical report section describing demonstration of RDM tools to one or more of the case studies listed above – June 30, 2017

13o. Final technical report section describing demonstration of RDM tools to one or more of the case studies listed above – July 14, 2017

EPA

United States Environmental Protection Agency
Washington, DC 20460

Work Assignment

Work Assignment Number: 3-07

☐ Other ☒ Amendment Number: 000002

Contract Number	Contract Period	Title of Work Assignment/SF Site Name
EP-C-13-039	09/11/2013 To 07/31/2017 Base Option Period Number 3	Enhancements to WMOST

Contractor	Specify Section and paragraph of Contract SOW
ABT ASSOCIATES INC.	A2.1,A2.2,A2.3,A3,A6,B1,C1,C7,D1,D2,G

Purpose:
- ☐ Work Assignment
- ☒ Work Assignment Amendment
- ☒ Work Plan Approval
- ☐ Work Assignment Close-Out
- ☐ Incremental Funding

Period of Performance: From 12/08/2016 To 07/31/2017

Comments:

☐ Superfund — Accounting and Appropriations Data — ☒ Non-Superfund

Note: To report additional accounting and appropriations date use EPA Form 1900-69A.

SFO (*Max 2*) ☐

Line	DCN (Max 6)	Budget/FY (Max 4)	Appropriation Code (Max 6)	Budget Org/Code (Max 7)	Program Element (Max 9)	Object Class (Max 4)	Amount (Dollars)	(Cents)	Site/Project (Max 8)	Cost Org/Code
1										
2										
3										
4										
5										

Authorized Work Assignment Ceiling

	Cost/Fee	LOE
Contract Period: 09/11/2013 To 07/31/2017	$222,740.00	2232
This Action:	$101,320.00	1,351
Total:	$324,060.00	3,583

Work Plan / Cost Estimate Approvals

	Cost/Fee	LOE
Contractor WP Dated: 12/29/2016	$101,320.00	1,351
Cumulative Approved:	$324,060.00	3,583

Work Assignment Manager Name: Naomi Detenbeck (Signature) (Date)	Branch/Mail Code: Phone Number: 401-782-3162 FAX Number:
Project Officer Name: Ahmar Siddiqui (Signature) (Date)	Branch/Mail Code: Phone Number: 202-566-1044 FAX Number:
Other Agency Official Name (Signature) (Date)	Branch/Mail Code: Phone Number: FAX Number:
Contracting Official Name: Tammy Adams TAMMY ADAMS Digitally signed by TAMMY ADAMS DN: c=US, o=U.S. Government, ou=USEPA, ou=Staff, cn=TAMMY ADAMS, dnQualifier=0000018417 Date: 2017.01.18 08:06:10 -05'00' (Signature) (Date)	Branch/Mail Code: Phone Number: 513-487-2030 FAX Number: 513-487-2545

EPA

United States Environmental Protection Agency
Washington, DC 20460

Work Assignment

Work Assignment Number: 3-09

☐ Other ☐ Amendment Number:

Contract Number	Contract Period	Title of Work Assignment/SF Site Name
EP-C-13-039	09/11/2013 To 07/31/2017 Base Option Period Number 3	OW Benefits Support

Contractor	Specify Section and paragraph of Contract SOW
ABT ASSOCIATES INC.	Section 2, paragraph 2

Purpose:
- [X] Work Assignment
- [ ] Work Assignment Amendment
- [ ] Work Plan Approval
- [ ] Work Assignment Close-Out
- [ ] Incremental Funding

Period of Performance: From 08/04/2016 To 07/31/2017

Comments:

☐ Superfund — Accounting and Appropriations Data — [X] Non-Superfund

SFO (*Max 2*): ☐

Note: To report additional accounting and appropriations date use EPA Form 1900-69A.

Line	DCN (Max 6)	Budget/FY (Max 4)	Appropriation Code (Max 6)	Budget Org/Code (Max 7)	Program Element (Max 9)	Object Class (Max 4)	Amount (Dollars)	(Cents)	Site/Project (Max 8)	Cost Org/Code
1										
2										
3										
4										
5										

Authorized Work Assignment Ceiling

Contract Period:	Cost/Fee:	LOE:
09/11/2013 To 07/31/2017		0
This Action:		2,750
Total:		2,750

Work Plan / Cost Estimate Approvals

Contractor WP Dated:	Cost/Fee	LOE:
Cumulative Approved:	Cost/Fee	LOE:

Work Assignment Manager Name: Todd Doley (Signature) (Date)	Branch/Mail Code: Phone Number: 202-566-1160 FAX Number:
Project Officer Name: Ahmar Siddiqui (Signature) (Date)	Branch/Mail Code: Phone Number: 202-566-1044 FAX Number:
Other Agency Official Name: (Signature) (Date)	Branch/Mail Code: Phone Number: FAX Number:
Contracting Official Name: Tammy Adams TAMMY ADAMS Digitally signed by TAMMY ADAMS DN: c=US, o=U.S. Government, ou=USEPA, ou=Staff, cn=TAMMY ADAMS, dnQualifier=0000018417 Date: 2016.08.04 13:30:05 -04'00' (Signature) (Date)	Branch/Mail Code: Phone Number: 513-487-2030 FAX Number: 513-487-2545

PERFORMANCE WORK STATEMENT

I. Title: Revisions to OW Benefits Analysis Methods and Models

Contractor: Abt Associates **Contract No.:** EP-C-13-039

II. Work Assignment Number: 3-09

III. Estimated Period of Performance: Date of Issuance to July 31, 2017

IV. Estimated Level of Effort: 2,750 hours

V. Key EPA Personnel:

Work Assignment Contracting Officer's Representative (WACOR):	Todd Doley OW/OST 202/566-1160
Alternate WACOR:	Michael Trombley OW/WPS 202/ 564-3906

VI. Background and Purpose:

The 1972 Clean Water Act (CWA) directs the Environmental Protection Agency (EPA or Agency) to develop national technology-based regulations for categories of industries that discharge pollutants directly to surface waters (effluent guidelines or ELGs) or that discharge pollutants indirectly through sewage treatment plants (pretreatment standards). The CWA also directs EPA to develop national technology-based regulations for new industrial facilities (new source performance standards).

Under Executive Orders 12866 and 13563, EPA is required to estimate the potential benefits and costs to society. As such, the purpose of this Work Assignment (WA) is to provide technical support to EPA in completing its response to industry petitions. The contractor has begun to revise the economic analysis with new engineering cost estimates which have been revised based on comments EPA received. The contractor is also making significant changes to methodologies the previous contractor used, as well as correcting data entry errors in the spreadsheets underlying the analysis.

Under this work assignment the contractor shall conduct all analyses requiring the collection and manipulation of data and models in accordance with the EPA approved quality assurance project plan (QAPP) that was based on Task 2 QAPP language.

VII. General Requirements of the Work Assignment and Schedule

Confidential Business Information: During the course of the work assignment, the contractor will not be accessing and evaluating CBI.

Budget Reporting: The contractor under this work assignment is required to report to the EPA WACOR

when 75 percent of the total work assignment funding amount has been depleted. The contractor must also report to the EPA WACOR when 75 percent of the approved Work plan budget has been depleted.

Identification as Contracting Staff: To avoid the perception that contractor personnel are EPA employees, contractor personnel shall be clearly identified as independent contractors of EPA when participating in events with outside parties and prior to the start of any meeting. Contractor personnel are prohibited from acting as the Agency's official representative. When speaking with the public, the contractor shall refer all interpretations of policy to the EPA WACOR.

Limitation of Contractor Activities: The contractor shall submit drafts of all deliverables to the EPA WACOR for review prior to submission of the final product. These drafts shall clearly specify the methods, procedures, considerations, assumptions, relevant citations, data sources and data that support any conclusions and recommendations. The contractor shall incorporate all EPA WACOR comments into all final deliverables, unless otherwise agreed upon by the EPA WACOR. The contractor shall adhere to all applicable EPA management control procedures as implemented by the EPA Contracting Officer (CO), EPA Contract-Level Contracting Officer's Representative (CL-COR), and EPA WACOR.

Quick Response: Under this Performance Work Statement the contractor may be required to provide information for use by EPA for quick responses and analyses of options, issues, and policy decisions. Quick responses are those which require completion in one to five working days.

Travel: The contractor shall not be required to travel under this work assignment.

Deliverable Formatting: All memos, draft comments, summaries and responses, and chapters shall be provided in hard copy and in electronic form using Word and/or Excel/Access, ArcView, or, in special cases another software program agreed to by EPA. Memos are to be written in a manner which will make them easy to turn into draft chapters for the Final Report. For deliverables that are in Word or pdf versions of Word documents, that are intended to be shared with management or the public, the contractor shall use decimal align in all tables containing columns of numbers of varying digits, whether decimal places are reported or not. All final materials, e.g., memos, chapters, etc. are to be prepared only after receiving written technical direction from the EPA WACOR.

VIII. Performance Work Statement

Task 1 - Prepare Work plan

The contractor shall prepare a work plan within 15 calendar days of receipt of the work assignment signed by the CO. The work plan shall outline, describe and include the technical approach, resources, timeline and due dates for deliverables, a detailed cost estimate by task, and a staffing plan. The EPA WACOR, the CL-COR and the CO will review the work plan. However, only the CO can approve/disapprove, suggest revisions, or change the work plan. Official revisions will be given to the contractor by the CO. The contractor shall prepare a revised work plan incorporating the CO's comments, if required.

The contractor shall include the completed Table 1 as a separate Appendix A to the work plan upon submittal to EPA (See task 2 below). This Appendix A should be a stand-alone document if quality assurance (QA) documentation is requested, therefore the Table 1 title must include the title of the WA, WA number, contract number, and what projects each covers. The WACOR has provided this information in the title, which the contractor may use to fulfill this requirement. If the contractor's review of this WA and Table identifies potential additional requirements, they shall be discussed with the WACOR.

A weekly update call with the EPA WACOR shall be required for this work assignment to discuss progress on deliverables and other potential issues.

Deliverables and schedule under Task 1

1a. Work plan within 15 calendar days of receipt of work assignment.

1b. Weekly Update Call.

Task 2 - Quality Assurance

2.1 Background

QAPPs are required under the Agency's Quality Assurance Policy CIO- 2105, formerly EPA Order 5360.1A2 and implementing guidance CIO-2105-P-01-0. All projects that involve the generation, collection, analysis and use of environmental data must have an approved QAPP in place prior to the commencement of the work. Examples of these environmental data operations are provided in Table 2.1 below.

Table 2.1. Examples of work that involves the collection, generation, evaluation, analysis, or use of environmental data

Item	Examples
Data	Includes field sampling information (sample location information, flow measurements, temperature, pH, physical observations, etc.), laboratory measurements (e.g., chemical, physical, biological, radiological measurements), data collected from questionnaires, economic data, census data, and any other types of existing data (i.e., data generated for a different purpose or generated by a different organization)
Data generation	Includes field studies, laboratory studies, and generation of modeling output
Data collection	Includes field surveys, questionnaire surveys, literature searches, and third party data
Data evaluation	Includes data inspection, review, assessment, and validation
Data analysis	Includes statistical, engineering, and economic analysis, and testing, evaluation, and validation of methods and models; database creation, data extraction, and data manipulation
Data Use	Any use of data to support EPA decisions, regulations, policy, publications, or tools (including effluent guidelines, 304(m) program, standards, environmental assessments, and models, tools, or reports disseminated by EPA to assist other organizations in implementing environmental programs)

Note that QAPPs are required for the development or revision of models and software that support the generation, collection, evaluation, analysis, or use of data. (A model is set of equations and assumptions used to predict unknown data.) When existing models are used as a tool to generate or evaluate data, the project QAPP must describe the model and explain how it will be used and how its output will be evaluated to ensure the modeling effort meets the overall quality objectives for the project. Development or revision of new models also must be supported by a QAPP that describes the objectives for the model,

the quality criteria that will be applied to the model, and the procedures for evaluating whether the model meets those criteria.

2.2 QA Project Plan Requirements

The Contractor has previously prepared a contract-wide Programmatic QAPP (PQAPP) for Contract EP-C-13-039. This PQAPP describes, in a single document, information that is not site or time-specific, but applies throughout the program (i.e., the duration of the contract). When tasked with preparing the PQAPP, the Contractor was informed that the PQAPP may need to be supplemented with project-specific details to support individual work assignments that involve the collection, generation, evaluation, analysis, or use of environmental data.

The activities in this work assignment involve gathering, evaluating, analyzing, and otherwise using existing environmental data (also known as "secondary" use of data). However, EPA has determined that the Contractor is operating under the existing PQAPP and that the PQAPP addresses QA requirements for this work assignment. In support of this work assignment, the Contractor shall ensure that the work plan provides enough detail to clearly describe:

- Specific objectives of the project(s) supported by this work assignment.
- The type of data to be gathered or used under this work assignment to support the project objectives—including data from search engines, federal databases, EPA data bases, letters from industry—as a well as a rationale for when those sources are appropriate and what data available in each will support the project
- The quality objectives needed to ensure the data will support the project objectives, and
- The quality assurance and quality control (QA/QC) activities to be performed to ensure that any results obtained are documented and are of the type, quality, transparency, and reproducibility needed.

Table 1 at the end of this WA demonstrates how the PQAPP addresses QA requirements for this work assignment. The contractor shall fill in staff roles to the Table 1 checklist under A.4 and make any additional detailed notes in the 'explanatory comments' column as requested by the WACOR.

2.3 Additional QA Documentation Required

The EPA Quality Manual for Environmental Programs (CIO 2105-P-01-0, May 2000) requires published Agency reports containing environmental data to be accompanied by a readily identifiable section or appendix that discusses the quality of the data and any limitations on the use of the data with respect to their originally intended application. The EPA Quality Manual further requires Agency reports to be reviewed by the QA manager (or other authorized official) before publication to ensure that an adequate discussion of QA and QC activities is included. The purpose of the review is to ensure the reports provide enough information to enable a knowledgeable reader to determine if the technical and quality goals were met for the intended use of the data. Reports should include applicable statements regarding the use of any environmental data presented as a caution about possible misuse of the data for other purposes.

For example, a Technical Support Document or Study Report must include a clear discussion of the quality management strategies (including the project goals and objectives, quality objectives and criteria, and quality assurance/quality control (QA/QC) practices) that were employed to control and document the quality of data generated and used. These documents should also discuss any deviations from procedures

documented in the EPA-approved QAPP(s) supporting the project, the reasons for those deviations, any impact of those deviations had on data quality, and steps taken to mitigate data quality issues.

In support of this Agency requirement, all major deliverables (e.g., Technical Support Documents, Study Reports, Analytical Methods) produced by the Contractor under this work assignment must include a discussion of the QA/QC activities that were performed to support the deliverable. Upon receipt, the EPA WACOR will review each applicable report and certify whether the Contractor has adhered to the QA requirements documented in the Contractor's PQAPP.

The Contractor also shall provide EPA with monthly reports of QA activities performed during implementation of this work assignment. These monthly QA reports shall identify QA activities performed to support implementation of this work assignment, problems encountered, deviations from the QAPP, and corrective actions taken. If desired, the Contractor may include this as a part of the contract-required monthly financial/technical progress report. If the contractor's monthly reports identify potential additional QA requirements, they shall be discussed with the WACOR.

2.4 Data Quality Act/Information Quality Guidelines Requirements

The Data Quality Act (also known as the Information Quality Act) requires EPA to ensure that influential information disseminated by the Agency is sufficiently transparent in terms of data and methods of analysis that the information is capable of being substantially reproduced. To support compliance with these data transparency/data reproducibility requirements, EPA plans to include QAPPs as part of any rulemaking record documentation to be made available to the public. (This includes PQAPPs and Supplemental QAPPS (SQAPPs).) The Contractor may claim information in QAPPs as confidential; if the Contractor chooses to do so, the Contractor shall submit a sanitized (i.e., public) version and an unsanitized (i.e., confidential) version at the time the QAPP is submitted for approval by EPA. The sanitized version shall be included in the public docket for the applicable rulemaking (or other docket record), and the unsanitized version shall be included in a non-public (i.e., confidential) portion of the docket (or record).

Information contained in the approved QAPP shall be transparent and reproducible and meet the requirements of the Data Quality Act for influential information. EPA's *Guidelines for Ensuring and Maximizing the Quality, Objectivity, Utility, and Integrity, of Information Disseminated by the Environmental Protection Agency* (EPA/260R-02-008, October 2002), referred to as "EPA's Information Quality Guidelines," describe EPA procedures for meeting Data Quality Act requirements. Section 6.3 of EPA's Information Quality Guidelines indicate that "especially rigorous robustness checks" should be applied in circumstances where quality-related information cannot be disclosed due to confidentiality issues. Where applicable, the Contractor should indicate which results were obtained using the tools (standard operating procedures (SOPs), checklists, and guidelines) that the Contractor designates as confidential so that the EPA WACOR can easily identify the areas that shall require rigorous robustness checks and document that those checks have been performed. At the discretion of the EPA WACOR, the contractors may be requested to prepare pre-dissemination review checklist as described in Appendix B of the Office of Water Quality Management Plan, April, 2015. If this is required, the EPA WACOR will notify the Contractor through written technical direction.

Deliverables and schedule under Task 2

2. **Monthly reports of QA work performed (may be included in the Contractor's monthly progress report).**

Task 3 - Adherence to the Standardized Naming Convention and Version Control

The contractor shall continue to follow the standardized naming convention and version control (SNCVC) for all deliverables associated with the WA. This SNCVC was established under the previous WA in a signed memorandum. This system ensures that deliverables are clearly named and dated and that the sequence of versions of a document is clear.

No deliverables under Task 3

Task 4 – Perform Assessment of Bayesian Alternative to Standard Statistical Approach for Meta-analysis

The contractor shall take the meta-regression model that incorporates distance decay, developed under the previous work assignment (WA 2-09) of this contract, and update it so that there is a Bayesian version. The contractor shall deliver a memorandum (4-8 pages) that presents the model results. Using this distance decay Bayesian model and the Bayesian model MRM2-Sb developed under WA 2-09 the contractor shall perform a benefit transfer application for the 20 watersheds modeled for the stormwater benefits analysis under WA 2-09. The contractor shall deliver a memorandum (5-10 pages) that compares the Bayesian model results to those derived using the classical statistical approach.

Deliverables and schedule under Task 4

4a. Distance Decay Bayesian Model Memorandum should be delivered September 2, 2016.
4b. If required, a revised Distance Decay Bayesian Model memorandum within 7 calendar days of receipt of comments from the EPA WACOR, at technical direction of EPA WACOR.
4c. Bayesian Model Benefit Transfer Application Results and Comparison Memorandum should be delivered September 30, 2016.
4d. If required, a revised Bayesian Model Benefit Transfer Application Results and Comparison memorandum within 7 calendar days of receipt of comments from the EPA WACOR, at technical direction of EPA WACOR.

Task 5 – Meta-analysis Documentation
The contractor shall synthesize material from the earlier meta-analysis peer review report, the Steam Electric Effluent Limitation Guideline (ELG) Benefits Analysis documentation, and work performed under WA 2-09 to write three documents. The first document shall provide recommendations for researchers planning and implementing stated preference surveys on how they can collect and present their results in a manner that will improve the agency's ability to incorporate the results into future versions of the meta-analysis. This memorandum (5-10 pages) shall focus specifically on the process of incorporating existing research data into the meta-analysis. Secondly, the contractor shall write a memorandum (5-10 pages) that explains how the above mentioned research has advanced the agency's ability to perform benefit transfer applications and what the most outstanding issues that remain are. Finally, the contractor shall develop a draft Meta-analysis Report intended for submission to the EPA Scientific Advisory Board, Environmental Economics Advisory Committee for review.

Deliverables and schedule under Task 5

5a. Recommendations for Stated Preference Analyses to Facilitate Incorporation into Meta-analysis Memorandum should be delivered by October 7, 2016.
5b. If required, a revised Recommendations for Stated Preference Analyses to Facilitate Incorporation into Meta-analysis memorandum within 7 calendar days of receipt of comments from the EPA WACOR, at technical direction of EPA WACOR.
5c. Benefits Transfer Advancements and Remaining Issues Memorandum should be delivered by November 14 2016.
5d. If required, a revised Benefits Transfer Advancements and Remaining Issues memorandum within 7 calendar days of receipt of comments from the EPA WACOR, at technical direction of EPA WACOR.
5e. Draft Meta-analysis Report should be delivered by December 16, 2016.
5f. If required, a revised Meta-analysis Report within 14 calendar days of receipt of comments from the EPA WACOR, at technical direction of EPA WACOR.

Task 6 – Develop Calibration and Validation Approaches for the Water Quality Index (WQI)

Limited attention has been spent on calibrating the index and validating the scores against other metrics of water quality. This task continues work begun under previous work assignment 2-09 on assessing data sources that could be used for calibration and validation efforts, and possibly for the construction of new indices. The task also covers development and testing of calibration/validation approaches.

There are numerous data sources that could be utilized to inform the design of the index, calibrate parameters, and/or verify the validity of the index. The contractor shall perform an assessment of potential data sources that could be used for validating and/or calibrating the WQI. Data sets to consider for assessment are those that measure presence of pollutant parameters in water, indicators of potential impairment (secci depth, biological indices), or frequency of occurrence for or numbers of impairment events (beach closures, fish consumption advisories, harmful algal blooms (HABs), etc.). Examples of data sources are the US Geological Surveys National Water Quality Assessment (NAWQA) and/or EPA National Aquatic Resource Surveys (NARS) databases, which could be used to identify "reference" sites minimally affected by anthropogenic pollution sources, and the 305(b) database which could be used for comparison with WQI scores. Under WA 2-09, the contractor delivered a data assessment memorandum (5-10 pages) that characterized the scope, scale, and reliability of various datasets, and provided a description of the way each data set could be used including a list of potential pros and cons. After the most appropriate data sources have been identified, the contractor shall develop calibration and/or validation approaches that rely on these data sets. The contractor shall then use these approaches to perform an assessment of the existing WQI. The contractor shall write a report (10-20 pages) that explains the approaches, presents the results, and provides recommendations.

Deliverables and schedule under Task 6

6a. A revised Data Assessment Memorandum within 14 calendar days of receipt of comments from the EPA WACOR, at technical direction of EPA WACOR.
6b. Calibration/Validation Report should be delivered by September 23, 2016.

6c. If required, a revised Calibration/Validation report within 14 calendar days of receipt of comments from the EPA WACOR, at technical direction of EPA WACOR.

Task 7 – Design Prototypes for Alternative Water Quality Indices

The contractor shall develop one or more prototypes for new alternative indices. The alternative indices are meant to be conceptual exercises rather than readily usable products. Ideally, they could be considered straw men that provide a future panel of experts something to respond to. Prototype development shall begin in two phases: assessing index design concepts; and the development of parameter sets along with subindex curves and weights. For each phase, the contractors shall produce a memorandum that provides alternatives to the current WQI approach. Based on review of the memorandums, the EPA WACOR will provide the contractor with technical direction on which options to proceed with for developing and testing.

The design phase focuses on addressing questions regarding what the index is meant to measure. What is the appropriate scale for minimum, maximum, and interim values? What are the benefit relevant indicators (BRI) that the index is meant to represent, and how are these BRI reflected in the scale? Similarly, what are the linking indicators (Boyd et al., 2014) that the index is meant to represent and how are these reflected? How would the index represent chronic versus acute impacts? How might the indices be responsive to a large set of pollutants, while also not diminishing the effects of the more prominent pollutants? How does the index reflect probability of occurrence of events such as harmful algal blooms? A good example of the types of alternative designs the contractor should consider is the Canadian Council of Ministers of the Environment (CCME) three dimensional index. The contractor shall write a memorandum (5-10 pages) describing possible designs for indices, identifying the pros and cons of each design.

The second phase focuses on the selection of parameters, development of subindices, and consideration of different weighting/aggregating schemes. Since the design of the index can influence each of these processes, phase two is not independent of phase one. However, the contractor can begin work on this second phase even before the completion of the first phase, using the design of the current index as a starting point. The contractor shall write a memorandum (5-10 pages) that outlines approaches for using the empirical data described in Task 6 above, to test different approaches for selecting parameters and deriving subindices. In the memorandum, the contractor shall describe various statistical techniques such as exploratory factor analysis, cluster analysis, fuzzy logic, etc., that could be used to identify parameters that best explain overall water and habitat quality. In addition, the contractor shall consider possible approaches for accounting for relationships among the parameters.

Boyd, James, Paul Ringold, Alan Krupnick, Robert J. Johnston, Matthew A. Weber and Kim Hall. 2014. "Ecosystem Services Indicators: Improving the Linkage between Biophysical and Economic Analyses," International Review of Environmental and Resource Economics, 2014, 8: 359–443.

Deliverables and schedule under Task 7

7a. Memorandum on Index Design Alternatives by November 21, 2016.
7b. If required, a revised Index Design Alternatives memorandum within 14 calendar days of

receipt of comments from the EPA WACOR, at technical direction of EPA WACOR.
7c. Memorandum on Empirical Approaches by January 13, 2017.
7d. If required, a revised Empirical Approaches memorandum within 14 calendar days of receipt of comments from the EPA WACOR, at technical direction of EPA WACOR.

Task 8 – WQI Documentation

The contractor shall revise the draft WQI Report, delivered under WA 2-09, to include the results of the calibration/validation work done under Task 6 and the development of the prototypes work under Task 7. The report is meant to provide both EPA staff and external experts the critical background needed to participate in a future workshop on Revising the WQI. The report shall identify potential modifications that could reasonably be considered in the short-term (1-5 years) and those that would require a longer time horizon (5> years).

Deliverables and schedule under Task 8

8a. Revised WQI Report should be delivered within 21 calendar days of receipt of technical direction from EPA WACOR to begin revising the report.
8b. If required, a revised report within 7 calendar days of receipt of comments from the EPA WACOR, at technical direction of EPA WACOR.

Task 9 – WQI Workshop Planning

EPA anticipates holding a future workshop to discuss WQI research topics with external environmental scientists, economists, and policy experts. To hold this workshop EPA will need support for identifying experts to attend the meetings; developing agendas and overseeing travel, meeting space, and lodging arrangements. The EPA WACOR does not expect to hold the workshop during the option period for this work assignment. However, the EPA WACOR does expect to need help identifying participants and developing a draft agenda.

Deliverables and schedule under Task 9

9a. Within 4 weeks of receiving technical direction from the EPA WACOR, the contractor shall work with the EPA WACOR and EPA staff to develop a list of potential experts to consider inviting to participate.
9b. Within 6 weeks of receiving technical direction from the EPA WACOR, the contractor shall develop a draft workshop agenda.

Task 10 – General Methodological and Analytical Support for Benefits Valuation Analyses

The EPA WACOR also anticipates the need for the contractor to produce three or four additional memoranda each approximately 5 pages in length. These memoranda would address specific issues that may arise during both the meta-analyses and WQI work described in Tasks 4-9 above. The specific content and deliverable dates will be provided to the contractor by the EPA WACOR through written technical direction, when the need for a memorandum arises.

Deliverables and schedule under Task 10

10. Additional deliverables (3-4 memorandums) as needed at technical direction of EPA WACOR.

EAD Checklist for WA 3-09 to OW Benefits Analysis Methods and Models, Contract EP-C-13-039, Utilizing Existing Data

The items noted in this checklist are adapted from those elements found in *EPA Requirements for QA Project Plans (QA/R-5)* (EPA, 2001a), but tailored to the use of existing data.

Table 1. EAD Checklist for WA 3-09 Utilizing Existing Data

QAPP Element	A = Applicable N/A = Not applicable		Covered in PQAPP?	Covered in SQAPP?	Ac = Acceptable NAc = Not Acceptable		Comments
	A	N/A			Ac	NAc	
A1. Title & Approval Sheet							
Project title	X		X				PQAPP Page ii
Organization's name	X		X				PQAPP Page ii
Effective date and/or version identifier	X		X				PQAPP Page ii
Dated signature of Organization's project manager	X		X				PQAPP Page ii
Dated signature of Organization's QA manager	X		X				PQAPP Page ii
Other signatures, as needed (e.g., EAD Project Officer, EAD QA Coordinator)	X		X				PQAPP Page ii
Revision History	X		X				PQAPP Page ii
A2. Table of Contents							
Includes sections, figures, tables, references, and appendices	X		X				PQAPP Page iv
Document control information indicated (when required by the EPA Project Manager and QA Manager)		X					PQAPP Page iv
A3. Distribution List							
Includes all individuals who are to implement or otherwise receive the QAPP and identifies their organization	X		X				PQAPP Page iii

QAPP Element	A = Applicable N/A = Not applicable		Covered in PQAPP?	Covered in SQAPP?	Ac = Acceptable NAc = Not Acceptable		Comments
	A	N/A			Ac	NAc	
A4. Project/Task Organization							
Identifies key individuals with their responsibilities (e.g., data users, decision makers, project QA manager, Subcontractors, etc.) and contact info.	X		X				PQA _____ Completed Checklist attached to work plan.
Organization chart shows lines of authority & reporting responsibilities	X		X				PQAPP Section 2.1
Project QA manager position indicates independence from unit collecting/using data	X		X				PQAPP Section 2.1
A5. Problem Definition/Background							
Clearly states problem to be resolved, decision to be made, or hypothesis to be tested	X		X				PQAPP Section 2.2
Identifies project objectives or goals	X		X				Reference PQAPP Table 2.2; also address in Work Plan if needed.
Historical & background information		X					
Cites applicable technical, regulatory, or program-specific quality standards, criteria, or objectives	X		X				PQAPP Section 2.2
A6. Project/Task Description							
List measurements to be made/data to obtain	X		X				PQAPP section 2.3
Notes special personnel or equipment requirements		X					
Provides work schedule		X					Will be addressed in workplan
A7. Overall Quality Objectives & Criteria							
States overall quality objectives and limits needed to support the project goals and objectives cited in Element A5.	X		X				PQAPP section 2. 4
A8. Special Training Requirements/ Certifications							
Identifies specialized skills, training or certification requirements	X		X				PQAPP section 2.5

QAPP Element	A = Applicable N/A = Not applicable		Covered in PQAPP?	Covered in SQAPP?	Ac = Acceptable NAc = Not Acceptable		Comments
	A	N/A			Ac	NAc	
Discusses how this training will be provided/the necessary skills will be assured and documented	X		X				PQAPP section 2.5
A9. Project-level Documents & Records							
Describes process for distributing the approved QAPP and other planning documents (and updates) to staff	X		X				PQAPP Section 2.6
Identifies final work products that will result from the project	X		X				Will be addressed in workplan
Describes the process for developing, reviewing, approving, and disseminating the final work products and individuals responsible for these processes	X		X				Will be addressed in workplan
B1. Data Needs							
Detailed list/description of the specific data elements needed to support project goals	X		X				Data used for the WA documented in PQAPP Section 3.1.
Description of the scope of the data elements that you need (e.g., data supporting specific treatment options vs. the full range of options, data supporting the entire country vs. a specific geographic region)	X		X				Data used for the WA documented in PQAPP Section 3.1.
If project includes development or update of a project database, QAPP identifies and defines each database field		X					Data used for the WA documented in PQAPP Section 3.1.
B2. Potential Data Sources							
Identifies and describes potential sources of the existing data needed (e.g., photographs, topographical maps, facility or state files, census data, meteorological data, publications, etc.) and the rationale for their use	X		X				Data used for the WA documented in PQAPP Section 3.1. Potential data sources listed in the PQAPP table 3-1 are data sources: 1.1, 1.2, 1.3, 1.7, 3.1, 3.2, 3.3, 3.6, and 3.7.Any new data that will be used for the WA that is not in the current PQAPP will be added in the next revision to the PQAPP.

QAPP Element	A = Applicable N/A = Not applicable		Covered in PQAPP?	Covered in SQAPP?	Ac = Acceptable NAc = Not Acceptable		Comments
	A	N/A			Ac	NAc	
If literature searches are used, describes the search engines that will be used and key search terms	X		X				Data used for the WA documented in PQAPP Section 3.1.
If databases or models will be used, describe the database (or model) in terms of who developed it and operates it and the type of data it contains	X		X				Data used for the WA documented in PQAPP Section 3.1. Any new data that will be used for the WA that is not in the current PQAPP will be added in the next revision to the PQAPP.
For other potential sources, describe the potential sources and rationale for considering or using each one	X		X				Data used for the WA documented in PQAPP Section 3.1. Any new data that will be used for the WA that is not in the current PQAPP will be added in the next revision to the PQAPP.
B3. Criteria for Selecting Data Sources							
Identifies each criterion that will be used to determine if the candidate data sources listed in B2 will meet your needs, and how each criterion is defined. (Criteria vary by project; examples include reliability, age, applicability, quantity, format, and others)	X		X				Documented in PQAPP Section 3.1. Any new data criteria that will be used for the WA that is not in the current PQAPP will be added in the next revision to the PQAPP.
Explains rating system used to evaluate source against each criterion	X		X				Documented in PQAPP Section 3.1. Any new data criteria that will be used for the WA that is not in the current PQAPP will be added in the next revision to the PQAPP.
B4. Data Value Selection Approach							
For data sources that meet the criteria identified in B3: Describes the criteria and procedures that will be used to determine which value(s) identified in the acceptable sources are most appropriate for use in the project	X		X				Documented in PQAPP Section 3.1.
For data that do not meet these pre-established criteria but are the only data available, explains how the decision to use such data will be made and documented	X		X				Documented in PQAPP Section 3.1.

QAPP Element	A = Applicable N/A = Not applicable		Covered in PQAPP?	Covered in SQAPP?	Ac = Acceptable NAc = Not Acceptable		Comments
	A	N/A			Ac	NAc	
B5. Resolving Data Gaps							
Describes the process for identifying and addressing data gaps that still exist after candidate data sources have been evaluated and appropriate data values have been identified	X		X				Documented in PQAPP Section 3.1.
Describes the process that will be used to address any new data needs revealed during the data gathering process (i.e., additional data elements not previously considered)	X						Documented in PQAPP Section 3.1.
B6. Data Gathering Documentation and Records							
Describes how results of the source selection and the data value selection will be documented, including any sources or values that were rejected and the rationale for not using them	X		X				Documented in PQAPP Section 3.1.
For data that are deemed acceptable and that will be used, explains how each data element will be associated to its original source citation (i.e., bibliographic information, telephone contact reports, email messages, etc.)	X		X				Documented in PQAPP Section 3.1.

QAPP Element	A = Applicable N/A = Not applicable		Covered in PQAPP?	Covered in SQAPP?	Ac = Acceptable NAc = Not Acceptable		Comments
	A	N/A			Ac	NAc	
C1. Standardization of Data Elements							
Describes the process to ensure that units and other key measures are captured and standardized (or otherwise made comparable) in the database	X		X				Documented in PQAPP Section 3.2.
If the project requires that all fields be standardized to a single set of units (e.g., US dollars for economic data, ug/L for chemical data), identifies the standard units that will be required for each data element	X		X				Documented in PQAPP Section 3.2.
Identifies the procedures for converting data reported in other units to the standardized units, including any rounding or truncating procedures, and procedures for ensuring these conversions are performed correctly	X		X				Documented in PQAPP Section 3.2.
If standardization of data elements is not needed, explains the process for ensuring that data presented in varying units are comparable enough for use in the project and that project staff members and other data users will be able to readily identify differences in units	X		X				Documented in PQAPP Section 3.2.
C2. Data Entry							
Explains the process for manually entering selected data into the project database, who will be responsible for such data entry, and the QC strategies that will be used to ensure that the database accurately and completely captures the data as presented in the original source	X		X				Data entry methods for the WA are documented in PQAPP Section 3.2.

QAPP Element	A = Applicable N/A = Not applicable		Covered in PQAPP?	Covered in SQAPP?	Ac = Acceptable NAc = Not Acceptable		Comments
	A	N/A			Ac	NAc	
C3. Merging or Uploading Electronic Data from Existing Sources							
If data are available electronically and will be uploaded or merged into the project database: describes the procedures that will be followed to ensure that errors are not introduced during the upload/merge process and that the final database reflects the original dataset(s)	X		X				Data entry methods for the WA are documented in PQAPP Section 3.2.
C4. Data Review							
Describes the process for ensuring that the data have been recorded, transmitted, and processed correctly	X		X				Data review for the WA are documented in PQAPP Section 3.2.
C5. Data Storage and Manipulation							
Describes how the existing data will be stored	X		X				Documented in PQAPP Section 3.2.
Describes who will be responsible for access to and maintenance of the stored data	X		X				Documented in PQAPP Section 3.2.
Describes how the existing data will be incorporated with other project data to support the project goal/decision to be made	X		X				Documented in PQAPP Section 3.2.
Describes the QC strategies that will be employed to ensure that the integrity of the data is not compromised during data storage, access/retrieval, updates, or other manipulation	X		X				Documented in PQAPP Section 3.2.

QAPP Element	A = Applicable N/A = Not applicable		Covered in PQAPP?	Covered in SQAPP?	Ac = Acceptable NAc = Not Acceptable		Comments
	A	N/A			Ac	NAc	
D1. Data Quality Verification and Data Quality Reporting							
Describes the process for verifying that the final set of data meets the overall criteria originally specified for the project	X		X				Data quality verification steps for the WA are documented in PQAPP Section 3.3.
Describes how these determinations will be documented and reported.	X		X				Documented in PQAPP Section 3.3.
For data that don't meet the pre-established specifications, explains the process for determining if they are usable and how such decisions will be documented	X		X				Documented in PQAPP Section 3.3.
D2. Use/Analysis of the Existing Data							
Provides details regarding the exact means in which the data will be used to meet project objectives	X		X				Documented in PQAPP Section 3.2.2.
Includes an explanation or list of the information to be calculated and the data elements that will be used to make those calculations	X		X				Documented in PQAPP Section 3.2.2.
Includes applicable calculations and equations (if known) or explanations of how they will be developed.	X		X				Documented in PQAPP Section 3.2.2.
Includes plans for excluding outliers.	X		X				Documented in PQAPP Section 3.2.2.
D3. Methodology Documentation and Conceptual Review							
If exact methodologies for analyzing the data will need to be developed or modified during the course of data analysis, explains the process by which such methodologies will be documented, who is responsible for reviewing/ approving their use, and how the methodologies will be checked to ensure they yield the desired products	X		X				Documented in PQAPP Section 3.2.3.

QAPP Element	A = Applicable N/A = Not applicable		Covered in PQAPP?	Covered in SQAPP?	Ac = Acceptable NAc = Not Acceptable		Comments
	A	N/A			Ac	NAc	
D4. Technical Review of the Data Analysis							
Describes activities that will be used to ensure the data analyses are being implemented as specified and will support project objectives	X		X				Technical review of data analysis for the WA are documented in PQAPP Section 3.3
Explains procedures for identifying and notifying appropriate personnel if changes to the originally planned procedures are warranted, and the process for approving, documenting and implementing such changes	X		X				Technical review of data analysis for the WA are documented in PQAPP Section 3.3
D5. Final Verification of Data Analysis and Reconciliation with User Requirements							
Describes the process for reviewing the final work product to ensure that the work was generated in accordance with the QAPP, and that the work product addresses the overall project goals and objectives	X		X				Final verification of data analysis for the WA are documented in PQAPP Section 3.3
Describes how the results of this assessment will be documented	X		X				Final verification of data analysis for the WA are documented in PQAPP Section 3.3
Describes how any limitations of the data or data analyses that were used to prepare the final work product will be documented and communicated	X		X				Final verification of data analysis for the WA are documented in PQAPP Section 3.3

EPA

United States Environmental Protection Agency
Washington, DC 20460

Work Assignment

Work Assignment Number: 3-09

☐ Other ☐ Amendment Number:

Contract Number	Contract Period	Title of Work Assignment/SF Site Name
EP-C-13-039	09/11/2013 To 07/31/2017 Base Option Period Number 3	OW Benefits Support

Contractor	Specify Section and paragraph of Contract SOW
ABT ASSOCIATES INC.	Section 2, paragraph 2

Purpose:
- [X] Work Assignment
- [ ] Work Assignment Amendment
- [X] Work Plan Approval
- [ ] Work Assignment Close-Out
- [ ] Incremental Funding

Period of Performance: From 08/04/2016 To 07/31/2017

Comments:

☐ Superfund — Accounting and Appropriations Data — [X] Non-Superfund

Note: To report additional accounting and appropriations date use EPA Form 1900-69A.

SFO (*Max 2*): ☐

Line	DCN (Max 6)	Budget/FY (Max 4)	Appropriation Code (Max 6)	Budget Org/Code (Max 7)	Program Element (Max 9)	Object Class (Max 4)	Amount (Dollars)	(Cents)	Site/Project (Max 8)	Cost Org/Code
1										
2										
3										
4										
5										

Authorized Work Assignment Ceiling

	Cost/Fee	LOE
Contract Period: 09/11/2013 To 07/31/2017	$0.00	0
This Action:	$292,315.00	2,673
Total:	$292,315.00	2,673

Work Plan / Cost Estimate Approvals

	Cost/Fee	LOE
Contractor WP Dated: 08/22/2016	$292,315.00	2,673
Cumulative Approved:	$292,315.00	2,673

Work Assignment Manager Name: Todd Doley (Signature) (Date)	Branch/Mail Code:	
	Phone Number:	202-566-1160
	FAX Number:	
Project Officer Name: Ahmar Siddiqui (Signature) (Date)	Branch/Mail Code:	
	Phone Number:	202-566-1044
	FAX Number:	
Other Agency Official Name (Signature) (Date)	Branch/Mail Code:	
	Phone Number:	
	FAX Number:	
Contracting Official Name: Tammy Adams TAMMY ADAMS Digitally signed by TAMMY ADAMS DN: c=US, o=U.S. Government, ou=USEPA, ou=Staff, cn=TAMMY ADAMS, dnQualifier=0000018417 Date: 2016.09.01 07:52:44 -04'00' (Signature) (Date)	Branch/Mail Code:	
	Phone Number:	513-487-2030
	FAX Number:	513-487-2545